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PRIVATE PILOT
QUESTION BOOK

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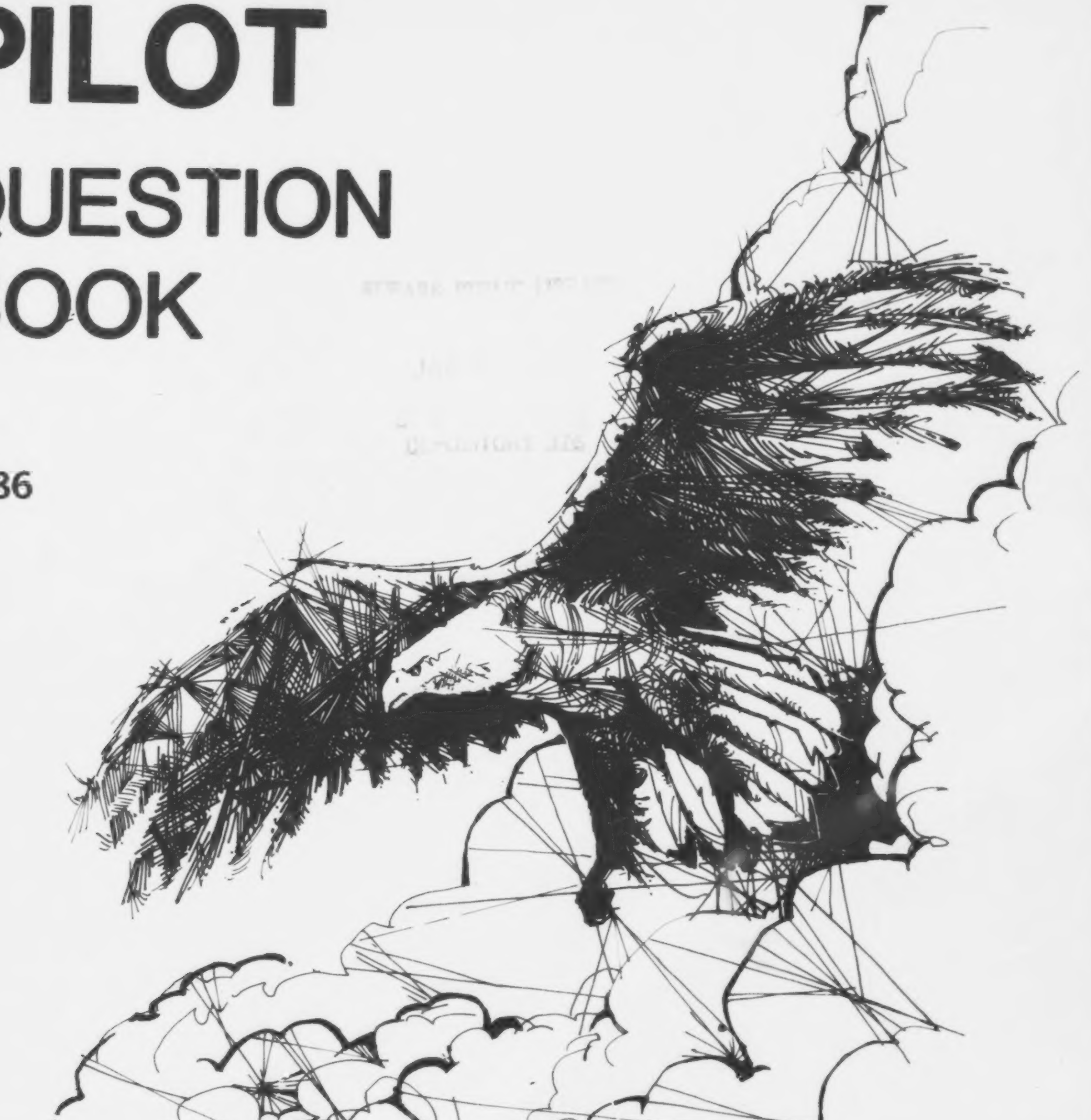

U.S. Department of Transportation
Federal Aviation Administration

Expires September 1, 1988

PRIVATE PILOT

Question Book

1986

READEX
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Aviation Standards National Field Office

MAXIMUM TIME ALLOWED FOR TEST: 4 HOURS

Materials to be used with this question book when used for airman testing:

1. Airman Written Test Application which includes the answer sheet.
2. Question Selection Sheet which identifies the questions to be answered.
3. Plastic overlay sheet which can be placed over performance charts for plotting purposes.

GENERAL INSTRUCTIONS FOR TAKING THE TEST

1. Read the instructions on page 1 of the Airman Written Test Application and complete page 4 of the form.
2. The question numbers in this question book are numbered consecutively beginning with No. 1001. Refer to the question selection sheet to determine which questions to answer.
3. For each item on the answer sheet, find the appropriate question in the book.
4. Mark your answer in the space provided for that item on the answer sheet.
5. Remember:

   Read each question carefully and avoid hasty assumptions. Do not answer until you understand the question. Do not spend too much time on any one question. Answer all of the questions that you readily know and then reconsider those you find difficult. Be careful to make necessary conversions when working with temperatures, speeds, and distances.

If a regulation or operations procedure is changed after this question book is printed, you will receive credit until the affected questions are revised.

THE MINIMUM PASSING GRADE IS 70.

WARNING

§ 61.37 Written tests: cheating or other unauthorized conduct.

(a) Except as authorized by the Administrator, no person may—

(1) Copy, or intentionally remove, a written test under this Part;

(2) Give to another, or receive from another, any part of copy of that test;

(3) Give help on that test to, or receive help on that test from, any person during the period that test is being given;

(4) Take any part of that test in behalf of another person;

(5) Use any material or aid during the period that test is being given; or

(6) Intentionally cause, assist, or participate in any act prohibited by this paragraph.

(b) No person whom the Administrator finds to have committed an act prohibited by paragraph (a) of this section is eligible for any airman or ground instructor certificate or rating, or to take any test therefor, under this chapter for a period of one year after the date of that act. In addition, the commission of that act is a basis for suspending or revoking any airman or ground instructor certificate or rating held by that person.

PREFACE

This book was developed by the Federal Aviation Administration to be used by Federal Aviation Administration testing centers and Federal Aviation Administration designated written test examiners when administering Private Pilot — Airplane, — Glider, — Helicopter, — Gyroplane, — Airship, — Hot Air Balloon, or — Gas Balloon Written Tests.

Private pilot applicants may use this book as a study guide. It is issued as FAA-T-8080-1A, Private Pilot Question Book and is available from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

or from U.S. Government Printing Office Bookstores located in major cities throughout the U.S.

The questions included in this publication are predicated on regulations, principles, and practices that were valid at the time of publication. The question selection sheets prepared for use with this question book are security items and are revised at frequent intervals.

The Federal Aviation Administration does not supply the correct answers to questions included in this book. Students should determine the answers by research and study, by working with instructors, or by attending ground schools. The Federal Aviation Administration is NOT responsible for either the content of commercial reprints of this book or the accuracy of the answers they may list.

Comments regarding this publication should be directed to:

U.S. Department of Transportation
Federal Aviation Administration
Aviation Standards National Field Office
Examinations Standards Branch
Operations Standards Section, AVN-131
P.O. Box 25082
Oklahoma City, Oklahoma 73125

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PRIVATE PILOT

INTRODUCTION

This book follows the new concept in presenting Federal Aviation Administration written tests to the private pilot applicants. It contains questions appropriate to the four categories of aircraft (airplane, rotorcraft, glider, and lighter than air). Question selection sheets are used to administer the proper written test to each applicant. Each test is constructed from the 778 questions included in Appendix 1.

The planned revision cycle is 24 months for the question book and 12 months for the associated question selection sheets. Each question book and selection sheet is dated to indicate its expiration date.

THE WRITTEN TEST

Questions and Scoring

The test questions are of the multiple-choice type. Mark the answers to the questions listed on the question selection sheet on AC Form 8080-3, Airman Written Test Application. Read the directions carefully before beginning the test. Incomplete or erroneous personal information entered on this form delays the scoring process.

The answer sheet is sent to the Mike Monroney Aeronautical Center in Oklahoma City where it is scored by computer. Shortly thereafter AC Form 8080-2, Airman Written Test Report, is sent to the applicant listing the score and test questions missed.

When reporting for a flight test, the applicant must present this form and be prepared to discuss those questions missed. This form must also be presented when retesting is required in the event of a written test failure.

Taking the Test

The test may be taken at Federal Aviation Administration testing centers, Federal Aviation Administration written test examiner's facilities, or other designated places. After completing the test, the applicant must surrender the issued question book, question selection sheet, answer sheet, and any papers used for computations or notations, to the monitor before leaving the test room.

When taking the test, keep the following points in mind:

1. Answer each question in accordance with the latest regulations and procedures.
2. Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
3. After formulating an answer, determine which of the alternatives most nearly corresponds with that answer. The answer chosen should completely resolve the problem.
4. From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete or are derived from popular misconceptions.
5. If a certain question is difficult for you, it is best to proceed to other questions. After the less difficult questions have been answered, return to those which gave you difficulty.
6. When solving a computer problem, select the answer nearest your solution. The problem has been checked with various types of computers; therefore, if you have solved it correctly, your answer will be closer to the correct answer than to any of the other choices.
7. To aid in scoring, enter personal data in the appropriate spaces on the test answer sheet in a complete and legible manner. Enter the test number printed on the question selection sheet.

Retesting—FAR 61.49

Applicants who receive a failing grade may apply for retesting by presenting their AC Form 8080-2, Airman Written Test Report—

> (1) after 30 days from the date the applicant failed the test; or
> (2) in case of the first failure, the applicant may apply for retesting before the 30 days have expired upon presenting a written statement from an authorized instructor certifying that the instructor has given ground instruction to the applicant and finds the applicant competent to pass the test.

APPENDIX 1

1001. What is true altitude?

1—Actual height above sea level corrected for all errors.
2—Altitude above the surface.
3—Altitude reference to the standard datum plane.
4—Altitude shown on a radar altimeter.

1002. Absolute altitude is the

1—altitude read directly from the altimeter.
2—altitude above the surface.
3—altitude reference to the standard datum plane.
4—indicated altitude corrected for instrument error.

1003. Density altitude is the

1—altitude reference to the standard datum plane.
2—pressure altitude corrected for nonstandard temperature.
3—altitude read directly from the altimeter.
4—altitude above the surface.

1004. How can pressure altitude be determined?

1—Set the field elevation in the altimeter setting window and read the indicated altitude.
2—Set the altimeter to the field elevation and read the value in the altimeter setting window.
3—Set the altimeter to zero and read the value in the altimeter setting window.
4—Set 29.92 in the altimeter setting window and read the indicated altitude.

1005. Altimeter setting is the value to which the scale of the pressure altimeter is set so the altimeter indicates

1—density altitude at sea level.
2—pressure altitude at sea level.
3—true altitude at field elevation.
4—pressure altitude at field elevation.

1006. What effect does high density altitude have on aircraft performance?

1—It increases engine performance.
2—It reduces an aircraft's climb performance.
3—It will decrease the runway length required for takeoff.
4—It increases lift because the light air exerts less force on the airfoils.

1007. Which factor would tend to increase the density altitude at a given airport?

1—Increasing barometric pressure.
2—Increasing ambient temperature.
3—Decreasing relative humidity.
4—Decreasing ambient temperature.

1008. What is the primary reason for computing density altitude?

1—To determine pressure altitude.
2—To determine aircraft performance.
3—To establish FL's (flight levels) above 18,000 ft. MSL.
4—To ensure safe cruising altitude over mountainous terrain.

1009. Under which condition(s) will pressure altitude be equal to true altitude?

1—When the atmospheric pressure is 29.92" Hg.
2—When standard atmospheric conditions exist.
3—When indicated altitude is equal to the pressure altitude.
4—When the OAT (outside air temperature) is standard for that altitude.

1010. Under what condition is pressure altitude and density altitude the same value?

1—At sea level, when the temperature is 0° F.
2—When the altimeter has no installation error.
3—When the altimeter setting is 29.92.
4—At standard temperature.

1011. Under what condition is the indicated altitude the same as true altitude?

1—If the altimeter has no mechanical error.
2—When at sea level under standard conditions.
3—When at 18,000 ft. with the altimeter set at 29.92.
4—At any altitude if the indicated altitude is corrected for nonstandard sea level temperature and pressure.

1012. Under what condition will true altitude be lower than indicated altitude with an altimeter setting of 29.92 even with an accurate altimeter?

1—In colder than standard air temperature.
2—In warmer than standard air temperature.
3—When density altitude is higher than indicated altitude.
4—Under higher than standard pressure at standard air temperature.

1013. Which condition would cause the altimeter to indicate a lower altitude than actually flown (true altitude)?

1—Air temperature lower than standard.
2—Atmospheric pressure lower than standard.
3—Pressure altitude the same as indicated altitude.
4—Air temperature warmer than standard.

1014. If the altimeter indicates 1,380 ft. when set to 29.92, what is the pressure altitude?

1—1,280 ft.
2—1,380 ft.
3—1,480 ft.
4—1,580 ft.

1015. If a flight is made from an area of low pressure into an area of high pressure without the altimeter setting being adjusted and a constant indicated altitude is maintained, the altimeter would indicate

1—the actual altitude above sea level.
2—higher than the actual altitude above sea level.
3—lower than the actual altitude above sea level.
4—the actual altitude above ground level.

1016. If a flight is made from an area of high pressure into an area of lower pressure without the altimeter setting being adjusted and a constant indicated altitude is maintained, the altimeter would indicate

1—lower than the actual altitude above sea level.
2—higher than the actual altitude above sea level.
3—the actual altitude above ground level.
4—the actual altitude above sea level.

1017. What is the effect of a temperature increase from 25° to 50° F on the density altitude if the pressure altitude remains at 5,000 ft.? (See Figure 1.)

1—1,650-foot increase.
2—1,400-foot increase.
3—1,200-foot increase.
4—1,000-foot increase.

1018. Determine the density altitude for the following conditions: (See Figure 1.)

Altimeter setting	29.25
Rwy temperature	+81° F
Airport elevation	5,250 ft.

1—4,600 ft.
2—5,877 ft.
3—8,400 ft.
4—7,700 ft.

1019. Determine the pressure altitude at an airport that is 3,563 ft. MSL with an altimeter setting of 29.96. (See Figure 1.)

1—3,527 ft.
2—3,556 ft.
3—3,639 ft.
4—3,507 ft.

1020. What is the effect of a temperature increase from 30° to 50° F on the density altitude if the pressure altitude remains at 3,000 ft.? (See Figure 1.)

1—900-foot increase.
2—1,100-foot decrease.
3—1,500-foot increase.
4—1,300-foot increase.

1021. Determine the density altitude for the following conditions: (See Figure 1.)

Altimeter setting	30.35
Rwy temperature	+25° F
Airport elevation	3,894 ft.

1—2,900 ft.
2—3,500 ft.
3—3,800 ft.
4—2,000 ft.

1022. Determine the pressure altitude at an airport that is 1,386 ft. MSL with an altimeter setting of 29.97. (See Figure 1.)

1—1,451 ft.
2—1,562 ft.
3—1,684 ft.
4—1,341 ft.

1023. What is the effect of a temperature decrease and a pressure altitude increase on the density altitude from 90° F and 1,250 ft. pressure altitude to 60° F and 1,750 ft. pressure altitude? (See Figure 1.)

1—500-foot increase.
2—1,300-foot decrease.
3—1,300-foot increase.
4—500-foot decrease.

1024. If a pilot changes the altimeter setting from 30.11 to 29.96, what is the approximate change in indication?

1—Altimeter will indicate 15 ft. higher.
2—Altimeter will indicate 15 ft. lower.
3—Altimeter will indicate 150 ft. lower.
4—Altimeter will indicate 150 ft. higher.

1025. If the outside air temperature at a given altitude is warmer than standard, the density altitude is

1—lower than pressure altitude, but approximately equal to the true altitude.
2—higher than true altitude, but lower than pressure altitude.
3—higher than the pressure altitude.
4—lower than true altitude.

1026. Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?

1—Low temperature, low relative humidity, and low density altitude.
2—High temperature, low relative humidity, and low density altitude.
3—High temperature, high relative humidity, and high density altitude.
4—Low temperature, high relative humidity, and high density altitude.

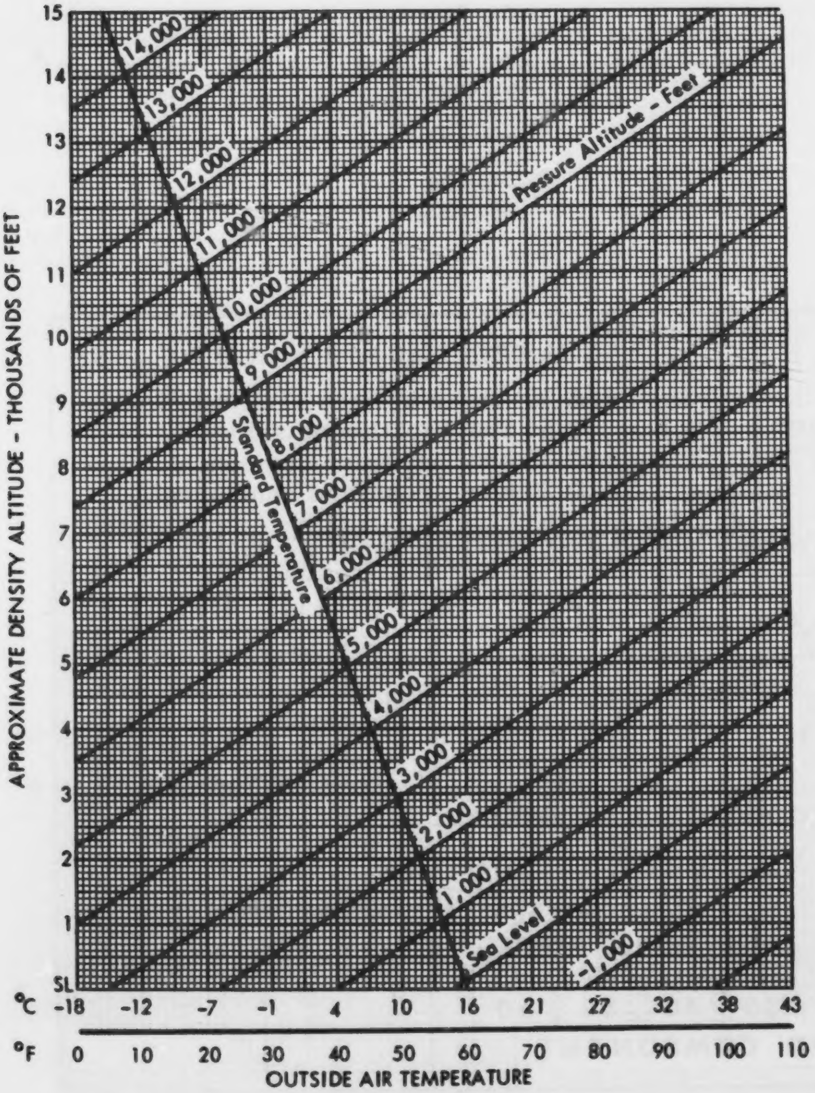
1027. What effect does higher density altitude have on propeller efficiency?

1—Increased efficiency due to less friction on the propeller blades.
2—Reduced efficiency because the propeller exerts less force than at lower density altitudes.
3—Reduced efficiency due to the increased force of the thinner air on the propeller.
4—Increased efficiency because the propeller exerts more force on the thinner air.

1028. How do variations in temperature affect the altimeter?

1—Pressure levels are raised on warm days and the indicated altitude is lower than true altitude.
2—Higher temperatures expand the pressure levels and the indicated altitude is higher than true altitude.
3—Lower temperatures lower the pressure levels and the indicated altitude is lower than true altitude.
4—Indicated altitude varies directly with the temperature.

DENSITY ALTITUDE CHART



Altimeter Setting (In. Hg.)	*Pressure Altitude Conversion Factor*
28.0	1,824
28.1	1,727
28.2	1,630
28.3	1,533
28.4	1,436
28.5	1,340
28.6	1,244
28.7	1,148
28.8	1,053
28.9	957
29.0	863
29.1	768
29.2	673
29.3	579
29.4	485
29.5	392
29.6	298
29.7	205
29.8	112
29.9	20
29.92	0
30.0	-73
30.1	-165
30.2	-257
30.3	-348
30.4	-440
30.5	-531
30.6	-622
30.7	-712
30.8	-803
30.9	-893
31.0	-983

Figure 1

1029. If it is necessary to set the altimeter from 29.15 to 29.85, what change is made on the indicated altitude?

1—70-foot increase.
2—700-foot increase.
3—700-foot decrease.
4—70-foot decrease.

1030. What is the headwind component for a landing on Rwy 18 if the tower reports the wind as 220° at 30 kts.? (See Figure 2.)

1—19 kts.
2—23 kts.
3—30 kts.
4—34 kts.

1031. Determine the maximum wind velocity for a 45° crosswind if the maximum crosswind component for the airplane is 25 kts. (See Figure 2.)

1—18 kts.
2—25 kts.
3—29 kts.
4—35 kts.

1032. With a reported wind of north at 20 kts., which runway (6, 14, 24, or 32) is appropriate for an airplane with a 13-knot maximum crosswind component? (See Figure 2.)

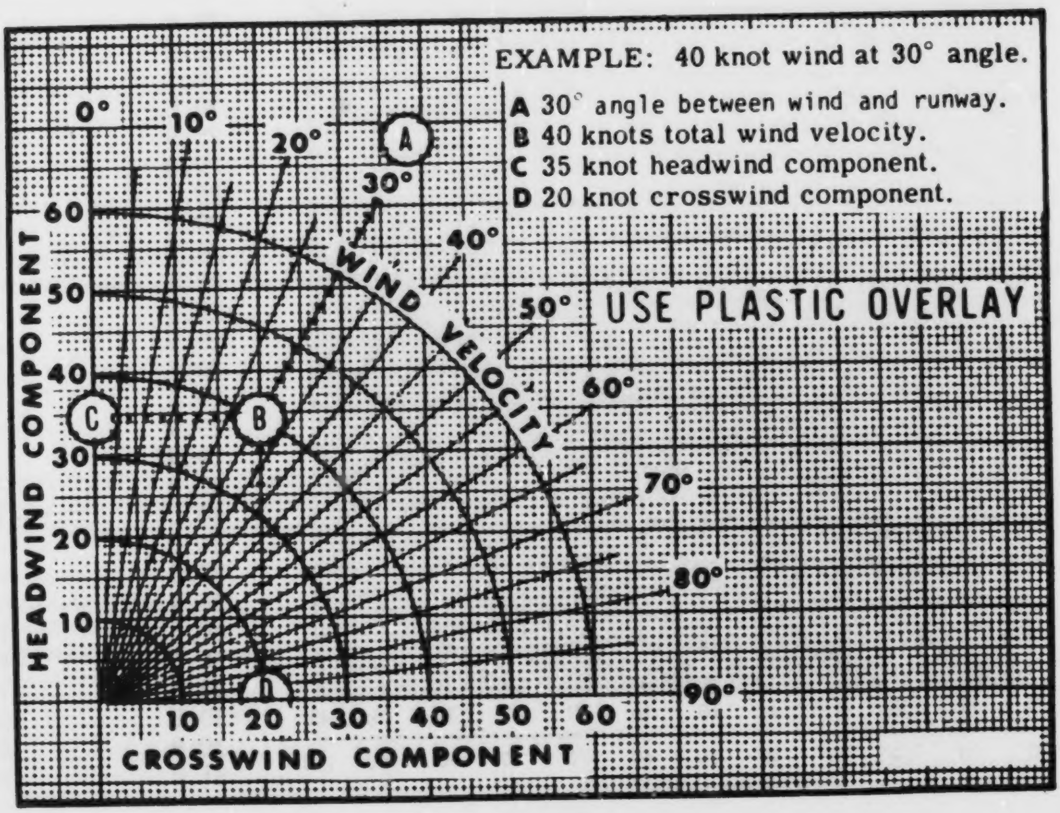
1—Rwy 6.
2—Rwy 14.
3—Rwy 24.
4—Rwy 32.

1033. What is the maximum wind velocity for a 30° crosswind if the maximum crosswind component for the airplane is 12 kts.? (See Figure 2.)

1—13 kts.
2—17 kts.
3—21 kts.
4—24 kts.

1034. With a reported wind of south at 20 kts., which runway (6, 14, 24, or 32) is appropriate for an airplane with a 13-knot maximum crosswind component? (See Figure 2.)

1—Rwy 6.
2—Rwy 14.
3—Rwy 24.
4—Rwy 32.


EXAMPLE: 40 knot wind at 30° angle.

A 30° angle between wind and runway.
B 40 knots total wind velocity.
C 35 knot headwind component.
D 20 knot crosswind component.

USE PLASTIC OVERLAY

Figure 2

1035. What is the crosswind component for a landing on Rwy 18 if the tower reports the wind as 220° at 30 kts.? (See Figure 2.)

1—19 kts.
2—23 kts.
3—30 kts.
4—34 kts.

1036. What is the expected fuel consumption for a 1,000–statute mile flight under the following conditions? (See Figure 3.)

Pressure altitude..........8,000 ft.
Temperature..........– 19° C
Manifold pressure..........19.5″ Hg
Wind..........Calm

1—41.9 gal.
2—63.5 gal.
3—71.4 gal.
4—73.2 gal.

1037. What is the expected fuel consumption for a 500–statute mile flight under the following conditions? (See Figure 3.)

Pressure altitude..........4,000 ft.
Temperature..........+29° C
Manifold pressure..........21.3″ Hg
Wind..........Calm

1—31.4 gal.
2—36.1 gal.
3—40.1 gal.
4—43.2 gal.

1038. What fuel flow should a pilot expect at 11,000 ft. on a standard day with 65 percent maximum continuous power? (See Figure 3.)

1—10.6 gal./hr.
2—11.2 gal./hr.
3—11.8 gal./hr.
4—12.1 gal./hr.

1039. Determine the approximate manifold pressure setting with 2,450 RPM to achieve 65 percent maximum continuous power at 6,500 ft. with a temperature of 36° F higher than standard. (See Figure 3.)

1—19.8 ″ Hg.
2—21.0 ″ Hg.
3—20.8 ″ Hg.
4—20.4 ″ Hg.

1040. Approximately what true airspeed should a pilot expect with 65 percent maximum continuous power at 9,500 ft. with a temperature of 36° F below standard? (See Figure 3.)

1—178 MPH.
2—181 MPH.
3—183 MPH.
4—186 MPH.

CRUISE POWER SETTINGS

65% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)
2800 LBS

	ISA –20°C (–36°F)								STANDARD DAY (ISA)								ISA +20°C (+36°F)							
PRESS ALT.	IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW PER ENGINE		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW PER ENGINE		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW PER ENGINE		TAS	
FEET	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	27	–3	2450	20.7	6.6	11.5	147	169	63	17	2450	21.2	6.6	11.5	150	173	99	37	2450	21.8	6.6	11.5	153	176
2000	19	–7	2450	20.4	6.6	11.5	149	171	55	13	2450	21.0	6.6	11.5	153	176	91	33	2450	21.5	6.6	11.5	156	180
4000	12	–11	2450	20.1	6.6	11.5	152	175	48	9	2450	20.7	6.6	11.5	156	180	84	29	2450	21.3	6.6	11.5	159	183
6000	5	–15	2450	19.8	6.6	11.5	155	178	41	5	2450	20.4	6.6	11.5	158	182	79	26	2450	21.0	6.6	11.5	161	185
8000	–2	–19	2450	19.5	6.6	11.5	157	181	36	2	2450	20.2	6.6	11.5	161	185	72	22	2450	20.8	6.6	11.5	164	189
10000	–8	–22	2450	19.2	6.6	11.5	160	184	28	–2	2450	19.9	6.6	11.5	163	188	64	18	2450	20.3	6.5	11.4	166	191
12000	–15	–26	2450	18.8	6.4	11.3	162	186	21	–6	2450	18.8	6.1	10.9	163	188	57	14	2450	18.8	5.9	10.6	163	188
14000	–22	–30	2450	17.4	5.8	10.5	159	183	14	–10	2450	17.4	5.8	10.1	160	184	50	10	2450	17.4	5.4	9.8	160	184
16000	–29	–34	2450	16.1	5.3	9.7	156	180	7	–14	2450	16.1	5.1	9.4	156	180	43	6	2450	16.1	4.9	9.1	156	178

NOTES: 1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.

Figure 3

1041. What is the best rate of climb speed for the helicopter according to the graph in Figure 4?

1—24 MPH.
2—40 MPH.
3—57 MPH.
4—60 MPH.

1042. According to the chart in Figure 4, the airspeed range to avoid while flying in ground effect is

1—0 - 25 MPH.
2—25 - 40 MPH.
3—25 - 57 MPH.
4—40 MPH and above.

1043. Which airspeed/altitude combinations should be avoided during helicopter operations? (See Figure 4.)

1—50 MPH/50 ft. AGL.
2—30 MPH/200 ft. AGL.
3—50 MPH/300 ft. AGL.
4—60 MPH/20 ft. AGL.

1044. Which airspeed/altitude combinations should be avoided during helicopter operations? (See Figure 4.)

1—20 MPH/200 ft. AGL.
2—35 MPH/175 ft. AGL.
3—40 MPH/75 ft. AGL.
4—60 MPH/60 ft. AGL.

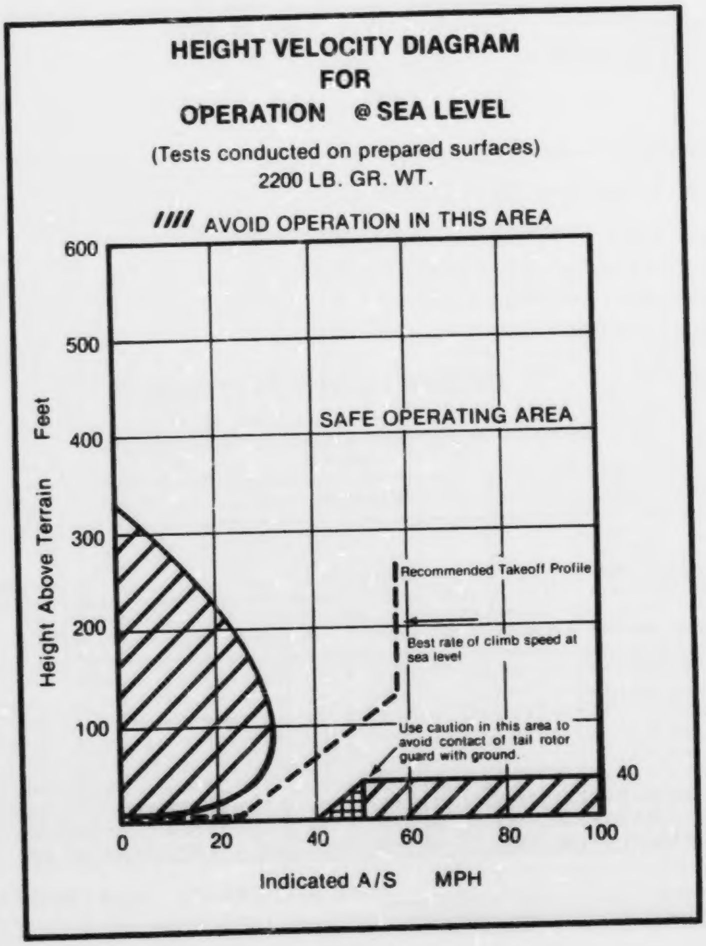


Figure 4

1045. How many feet will the glider sink in 1 mi. at 53 MPH in still air? (See Figure 5.)

1—113 ft.
2—144 ft.
3—171 ft.
4—211 ft.

1046. What speed will attain a sink rate of 5 ft./sec. in still air? (See Figure 5.)

1—75 MPH.
2—79 MPH.
3—84 MPH.
4—87 MPH.

1047. How many feet will the glider descend at minimum sink speed for 1 mi. in still air? (See Figure 5.)

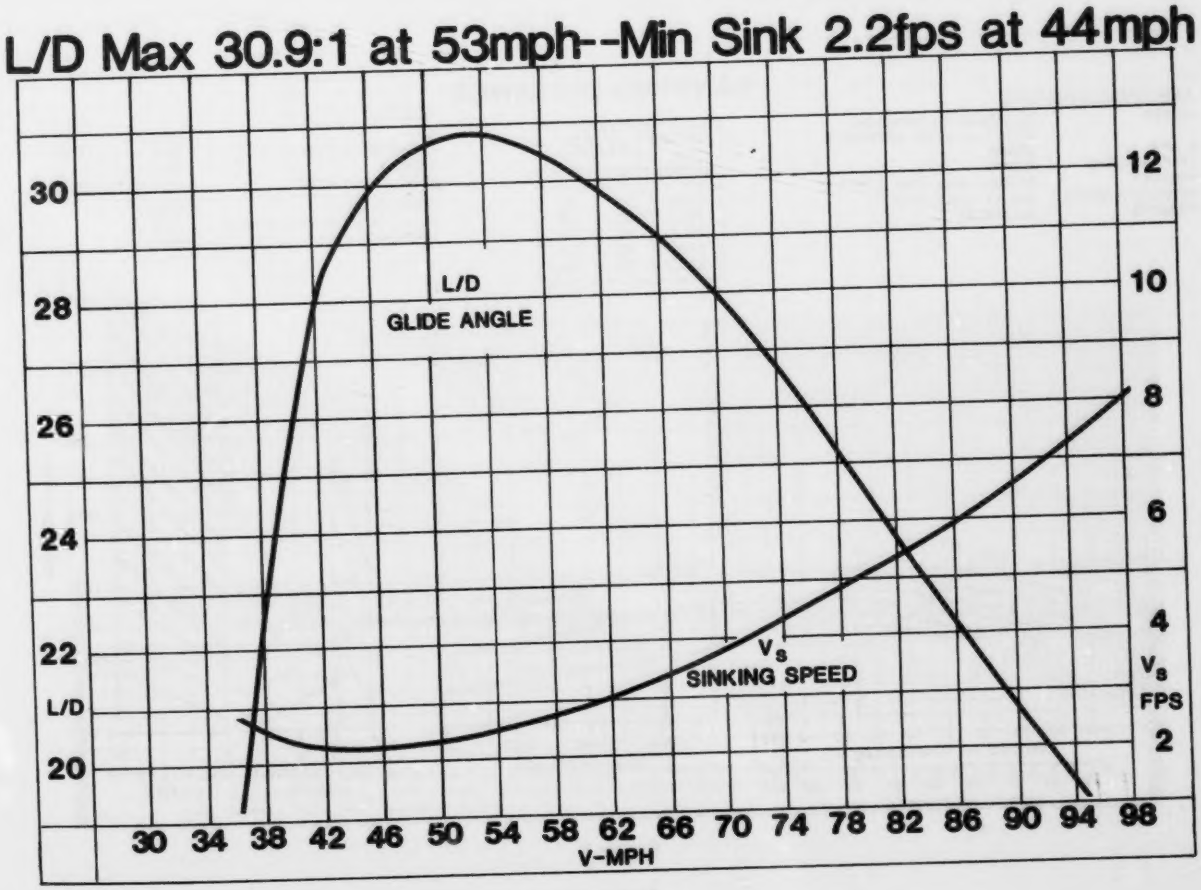
1—132 ft.
2—170 ft.
3—180 ft.
4—193 ft.

1048. At what speed will the glider gain the most distance while descending 1,000 ft. in still air? (See Figure 5.)

1—36 MPH.
2—44 MPH.
3—53 MPH.
4—83 MPH.

1049. What approximate lift/drag ratio will be attained at 68 MPH in still air? (See Figure 5.)

1—3.6 : 1.
2—10.5 : 1.
3—21.7 : 1.
4—28.5 : 1.



L/D Max 30.9:1 at 53mph--Min Sink 2.2fps at 44mph

Figure 5

1050. The principal reason the shaded area of a Height vs. Velocity Chart should be avoided is

1—turbulence near the surface can dephase the blade dampers.
2—rotor RPM may decay before ground contact is made if an engine failure should occur.
3—rotor RPM may build excessively high if it is necessary to flare at such low altitudes.
4—insufficient airspeed would be available to ensure a safe landing in case of an engine failure.

1051. Determine the total distance to land the airplane under the following conditions. (See Figure 6.)

OAT	Std.
Pressure altitude	2,000 ft.
Weight	2,300 lb.
Wind component	Calm

1—850 ft.
2—1,250 ft.
3—1,450 ft.
4—1,700 ft.

1052. What is the approximate ground roll distance after landing under the following conditions? (See Figure 6.)

OAT	90° F
Pressure altitude	4,000 ft.
Weight	2,800 lb.
Tailwind component	10 kts.

1—1,200 ft.
2—1,575 ft.
3—1,725 ft.
4—1,950 ft.

1053. What is the total landing distance under the following conditions? (See Figure 6.)

OAT	90° F
Pressure altitude	3,000 ft.
Weight	2,900 lb.
Headwind component	10 kts.
Obstacle	50 ft.

1—1,300 ft.
2—1,450 ft.
3—1,550 ft.
4—1,725 ft.

LANDING DISTANCE

ASSOCIATED CONDITIONS:

POWER	RETARDED TO MAINTAIN 900 FT/ on FINAL APPROACH
FLAPS	DOWN
LANDING GEAR	DOWN
RUNWAY	PAVED, LEVEL, DRY SURFACE
APPROACH SPEED	IAS AS TABULATED
BRAKING	MAXIMUM

WEIGHT ~ POUNDS	SPEED AT 50 FT	
	KNOTS	MPH
2950	70	80
2800	68	78
2600	65	75
2400	63	72
2200	60	69

EXAMPLE:

OAT	25°C (77°F)
PRESSURE ALTITUDE	3965 FT
WEIGHT	2814 LBS
WIND COMPONENT	9.0 KNOTS (HEADWIND)
GROUND ROLL	1080 FT
TOTAL OVER 50 FT OBSTACLE	1700 FT
APPROACH SPEED	68 KNOTS (78 MPH)

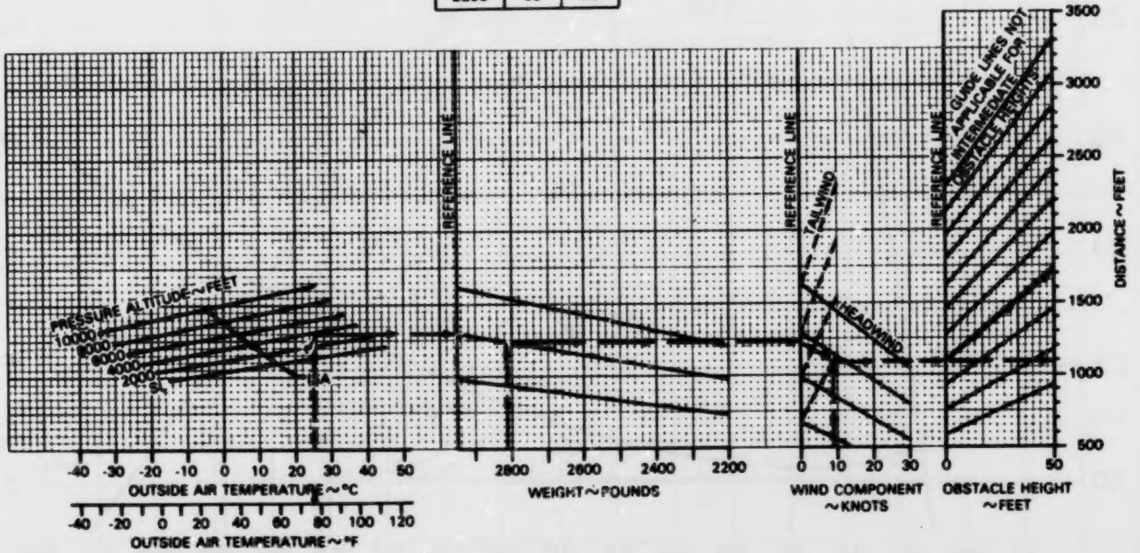


Figure 6

1054. With the following conditions, determine the landing ground roll from the Landing Distance Chart. (See Figure 7.)

Pressure altitude..Sea level
Headwind..4 kts.
Temperature..Std.

1—356 ft.
2—401 ft.
3—490 ft.
4—534 ft.

1055. What is the total landing distance required to clear a 50–foot obstacle with the following conditions using the Landing Distance Chart? (See Figure 7.)

Pressure altitude..7,500 ft.
Headwind..8 kts.
Temperature..Std.
Runway..Dry grass

1—1,004 ft.
2—1,205 ft.
3—1,506 ft.
4—1,757 ft.

1056. Determine the approximate landing roll distance from the Landing Distance Chart. (See Figure 7.)

Pressure altitude..3,750 ft.
Headwind..12 kts.
Temperature..Std.

1—193 ft.
2—338 ft.
3—628 ft.
4—772 ft.

1057. What is the total landing distance required to clear a 50–foot obstacle with the following conditions using the Landing Distance Chart? (See Figure 7.)

Pressure altitude..5,000 ft.
Headwind..8 kts.
Temperature..41° F
Runway..Hard surface

1—837 ft.
2—956 ft.
3—1,076 ft.
4—1,554 ft.

1058. Determine the total distance required to land over a 50–foot obstacle from the Landing Distance Chart. (See Figure 7.)

Pressure altitude..5,000 ft.
Headwind..Calm
Temperature..101° F

1—239 ft.
2—1,099 ft.
3—1,291 ft.
4—1,314 ft.

1059. What is the approximate landing ground roll distance using the Landing Distance Chart? (See Figure 7.)

Pressure altitude..1,250 ft.
Tailwind..8 kts.
Temperature..Std.

1—275 ft.
2—366 ft.
3—470 ft.
4—549 ft.

—LANDING DISTANCE—

FLAPS LOWERED TO 40° - POWER OFF
HARD SURFACE RUNWAY - ZERO WIND

GROSS WEIGHT LBS.	APPROACH SPEED, IAS, MPH	AT SEA LEVEL & 59° F.		AT 2500 FT. & 50° F.		AT 5000 FT. & 41° F.		AT 7500 FT. & 32° F.	
		GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT. OBS
1600	60	445	1075	470	1135	495	1195	520	1255

NOTES: 1. Decrease the distances shown by 10% for each 4 knots of headwind.
2. Increase the distance by 10% for each 60°F. temperature increase above standard.
3. For operation on a dry, grass runway, increase distances (both "ground roll" and "total to clear 50 ft. obstacle") by 20% of the "total to clear 50 ft. obstacle" figure.

Figure 7

1060. From the graph in Figure 8, determine the total landing distance to clear a 50-foot obstacle in the gyroplane if the OAT is 75° and the pressure altitude at the airport is 2,500 ft.

1—521 ft.
2—525 ft.
3—529 ft.
4—533 ft.

1061. Approximately how much additional landing distance will be required to clear a 50-foot obstacle with an increase of 20° F temperature at 3,200 ft. pressure altitude? (See Figure 8.)

1—4 ft.
2—8 ft.
3—12 ft.
4—16 ft.

1062. What is the total takeoff distance to clear a 50-foot obstacle if the temperature is 95° and the pressure altitude is 1,700 ft.? (See Figure 8.)

1—1,825 ft.
2—1,910 ft.
3—2,030 ft.
4—2,090 ft.

1063. Approximately how much additional takeoff distance to clear a 50-foot obstacle will be required if the temperature increases from 75° to 90° at a pressure altitude of 2,300 ft.? (See Figure 8.)

1—160 ft.
2—200 ft.
3—2,020 ft.
4—2,190 ft.

1064. Determine the total takeoff distance to clear a 50-foot obstacle if the temperature is standard at sea level pressure altitude. (See Figure 8.)

1—860 ft.
2—950 ft.
3—1,090 ft.
4—1,200 ft.

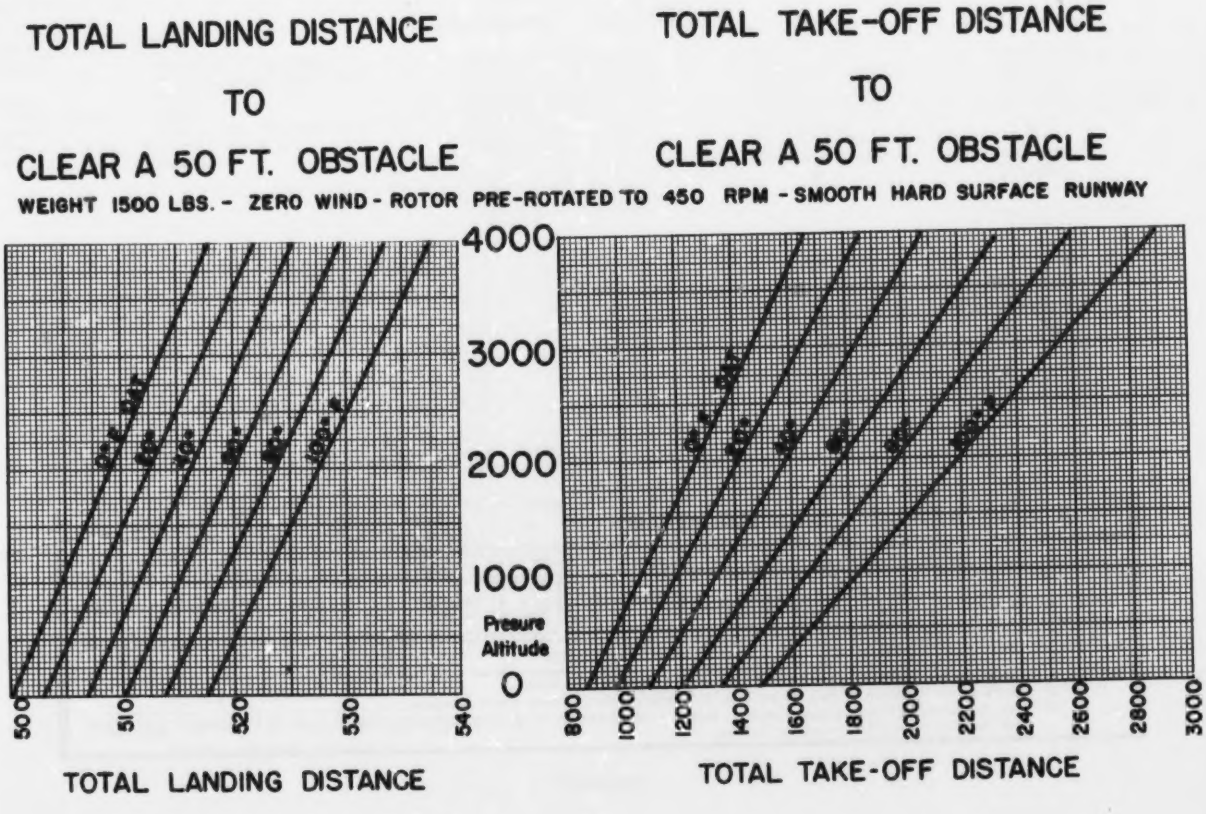


Figure 8

1065. Determine the total distance for a takeoff to clear a 50–foot obstacle. (See Figure 9.)

OAT	Std.
Pressure altitude	4,000 ft.
Takeoff weight	2,800 lb.
Headwind component	Calm

1—1,250 ft.
2—1,500 ft.
3—1,750 ft.
4—1,900 ft.

1066. What is the approximate ground roll distance for takeoff under the following conditions? (See Figure 9.)

OAT	100° F
Pressure altitude	2,000 ft.
Takeoff weight	2,750 lb.
Headwind component	Calm

1—1,150 ft.
2—1,300 ft.
3—1,800 ft.
4—2,000 ft.

1067. What is the total distance for a takeoff to clear a 50–foot obstacle under the following conditions? (See Figure 9.)

OAT	Std.
Pressure altitude	Sea level
Takeoff weight	2,700 lb.
Headwind component	Calm

1—1,000 ft.
2—1,400 ft.
3—1,700 ft.
4—1,900 ft.

1068. Determine the approximate ground roll distance for takeoff under the following conditions? (See Figure 9.)

OAT	90° F
Pressure altitude	2,000 ft.
Takeoff weight	2,500 lb.
Headwind component	20 kts.

1—650 ft.
2—800 ft.
3—1,000 ft.
4—1,250 ft.

TAKE-OFF DISTANCE

ASSOCIATED CONDITIONS:

POWER	FULL THROTTLE 2600 RPM
MIXTURE	LEAN TO APPROPRIATE FUEL PRESSURE
FLAPS	UP
LANDING GEAR	RETRACT AFTER POSITIVE CLIMB ESTABLISHED
COWL FLAPS	OPEN

WEIGHT ~ POUNDS	TAKE-OFF SPEED			
	LIFT-OFF		50 FT	
	KNOTS	MPH	KNOTS	MPH
2950	66	76	72	83
2800	64	74	70	81
2600	63	72	68	78
2400	61	70	66	76
2200	58	67	63	73

EXAMPLE:

OAT	15°C (59°F)
PRESSURE ALTITUDE	5650 FT
TAKE-OFF WEIGHT	2950 LBS
HEAD WIND COMP.	9.5 KNOTS
GROUND ROLL	1375 FT
TOTAL DISTANCE OVER A 50 FT OBSTACLE	2300 FT
TAKE-OFF SPEED AT	
LIFT-OFF	66 KNOTS (76 MPH)
50 FT	72 KNOTS (83 MPH)

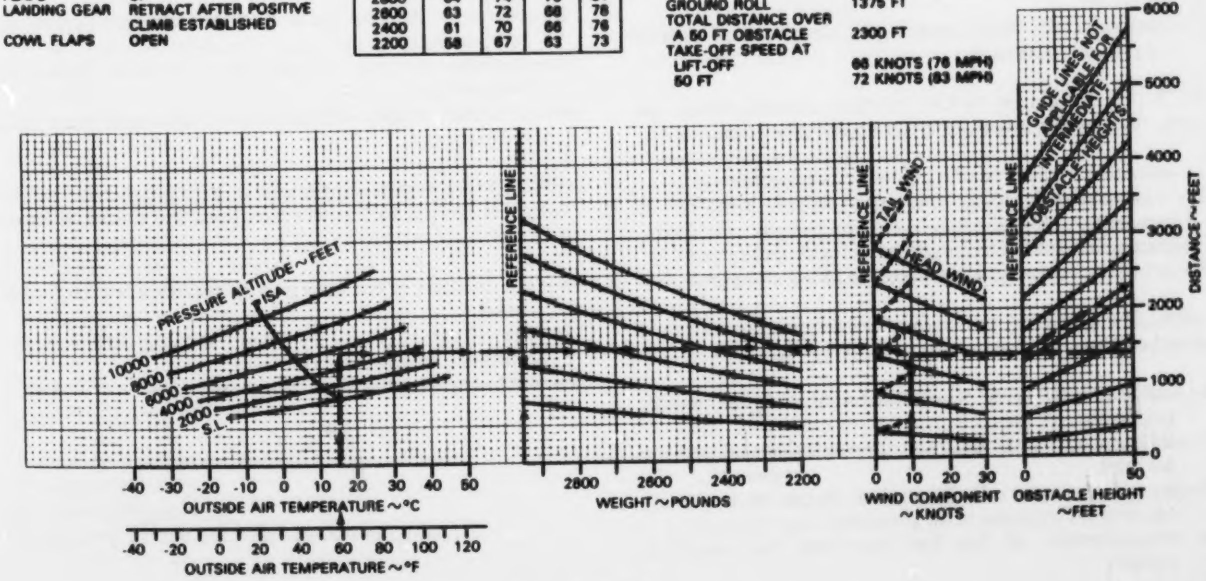


Figure 9

1069. Damper valves should normally be kept closed during the climb to altitude because any air forced into the system would

1—increase the amount of gas that must be exhausted to prevent the airship from ascending at an excessively high rate.
2—decrease the purity of the gas within the envelope.
3—increase the amount of air to be exhausted, resulting in a lower rate of ascent.
4—decrease the volume of gas within the envelope.

1070. In order to check the gas pressures (pressure height) of an airship during a climb, the air damper valves should

1—be opened forward and closed aft.
2—be opened aft and closed forward.
3—be opened.
4—be closed.

1071. How does the pilot know when pressure height has been reached?

1—Liquid in the gas and air manometers will rise above the normal level.
2—Liquid in the gas and air manometers will fall below the normal level.
3—Liquid in the gas manometer will fall and the liquid in the air manometer will rise above normal levels.
4—Liquid in the gas manometer will rise and the liquid in the air manometer will fall below normal levels.

1072. One of the main functions of flaps during the approach and landing is to

1—decrease the angle of descent without increasing the airspeed.
2—permit a touchdown at a higher indicated airspeed.
3—increase the angle of descent without increasing airspeed.
4—decrease lift, thus enabling a steeper-than-normal approach to be made.

1073. In comparison to fuel injection systems, float-type carburetor systems are generally considered to be

1—equally susceptible to icing as a fuel injection unit.
2—susceptible to icing only when visible moisture is present.
3—more susceptible to icing than a fuel injection unit.
4—less susceptible to icing than a fuel injection unit.

1074. The operating principle of float-type carburetors is based on the

1—automatic metering of air at the venturi as the aircraft gains altitude.
2—difference in air pressure at the venturi throat and the air inlet.
3—increase in air velocity in the throat of a venturi causing an increase in air pressure.
4—measurement of the fuel flow into the induction system.

1075. The presence of carburetor ice in an aircraft equipped with a fixed-pitch propeller can be verified by applying carburetor heat and noting

1—an increase in RPM and then a gradual decrease in RPM.
2—a decrease in RPM and then a constant RPM indication.
3—an immediate increase in RPM with no further change in RPM.
4—a decrease in RPM and then a gradual increase in RPM.

1076. Applying carburetor heat will

1—result in more air going through the carburetor.
2—not affect the mixture.
3—enrich the fuel/air mixture.
4—lean the fuel/air mixture.

1077. What change occurs in the fuel/air mixture when carburetor heat is applied?

1—A decrease in RPM results from the lean mixture.
2—No change occurs in the fuel/air mixture.
3—The fuel/air mixture becomes leaner.
4—The fuel/air mixture becomes richer.

1078. If an aircraft is equipped with a fixed-pitch propeller and a float-type carburetor, the first indication of carburetor ice would most likely be

1—a drop in oil temperature and cylinder head temperature.
2—engine roughness.
3—a drop in manifold pressure.
4—loss of RPM.

1079. The use of carburetor heat tends to

1—decrease engine output and increase operating temperature.
2—decrease engine output and decrease operating temperature.
3—increase engine output and increase operating temperature.
4—increase engine output and decrease operating temperature.

1080. If an engine continues to run after the ignition switch is turned to the OFF position, the probable cause may be

1—the mixture is too lean and this causes the engine to diesel.
2—the voltage regulator points are sticking closed.
3—a broken magneto ground wire.
4—fouled spark plugs.

1081. One purpose of the dual ignition system on an aircraft engine is to provide for

1—improved engine performance.
2—uniform heat distribution.
3—balanced cylinder head pressure.
4—easier starting.

1082. An abnormally high engine oil temperature indication may be caused by

1—the oil level being too low.
2—operating with a too high viscosity oil.
3—operating with an excessively rich mixture.
4—the oil level being too high.

1083. Excessively high engine temperatures, either in the air or on the ground, will

1—cause damage to heat-conducting hoses and warping of the cylinder cooling fins.
2—cause loss of power, excessive oil consumption, and possible permanent internal engine damage.
3—not appreciably affect an aircraft engine in either environment.
4—increase fuel consumption and may increase power due to the increased heat.

1084. For internal cooling, reciprocating aircraft engines are especially dependent on

1—a properly functioning thermostat.
2—air flowing over the exhaust manifold.
3—the circulation of lubricating oil.
4—a lean fuel/air mixture.

1085. If the engine oil temperature and cylinder head temperature gauges have exceeded their normal operating range, the pilot may have been

1—operating with the mixture set too rich.
2—operating with higher-than-normal oil pressure.
3—using fuel that has a higher-than-specified fuel rating.
4—operating with too much power and with the mixture set too lean.

1086. For what reason is methanol added to the propane fuel of hot-air balloons?

1—To check for fuel leaks.
2—As a fire retardent.
3—As an anti-icing additive.
4—To reduce the temperature.

1087. On a balloon equipped with a blast valve, the blast valve is used for

1—climbs and descents.
2—altitude control.
3—emergencies only.
4—valving off excess pressure in the tanks.

1088. Filling the fuel tanks after the last flight of the day is considered a good operating procedure because this will

1—force any existing water to the top of the tank away from the fuel lines to the engine.
2—prevent expansion of the fuel by eliminating airspace in the tanks.
3—prevent moisture condensation by eliminating airspace in the tanks.
4—eliminate vaporization of the fuel.

1089. Detonation occurs in a reciprocating aircraft engine when

1—the spark plugs are fouled or shorted out or the wiring is defective.
2—hot spots in the combustion chamber ignite the fuel/air mixture in advance of normal ignition.
3—there is too rich a fuel/air mixture.
4—the unburned charge in the cylinders explodes instead of burning normally.

1090. If a pilot suspects that the engine (with a fixed-pitch propeller) is detonating during climb-out after takeoff, normally the corrective action to take would be to

1—increase the rate of climb.
2—retard the throttle.
3—lean the mixture.
4—apply carburetor heat.

1091. If the grade of fuel used in an aircraft engine is lower than specified for the engine, it will most likely cause

1—a mixture of fuel and air that is not uniform in all cylinders.
2—lower cylinder head temperatures.
3—an increase in power which could overstress internal engine components.
4—detonation.

1092. The uncontrolled firing of the fuel/air charge in advance of normal spark ignition is known as

1—combustion.
2—pre-ignition.
3—atomizing.
4—detonation.

1093. On aircraft equipped with fuel pumps, the practice of running a fuel tank dry before switching tanks is considered unwise because

1—the engine-driven fuel pump or electric fuel boost pump may draw air into the fuel system and cause vapor lock.
2—the engine-driven fuel pump is lubricated by fuel and operating on a dry tank may cause pump failure.
3—any foreign matter in the tank will be pumped into the fuel system.
4—the fuel pump is located above the bottom portion of the fuel tank.

1094. Which of the following would most likely cause the cylinder head temperature and engine oil temperature gauges to exceed their normal operating range?

1—Using fuel that has a lower-than-specified fuel rating.
2—Using fuel that has a higher-than-specified fuel rating.
3—Operating with higher-than-normal oil pressure.
4—Operating with the mixture control set too rich.

1095. What type fuel can be substituted for an aircraft if the recommended octane is not available?

1—The next higher octane aviation gas.
2—The next lower octane aviation gas.
3—Unleaded automotive gas of the same octane rating.
4—Unleaded automotive gas of the next higher rating.

1096. If ample fuel is available, within which temperature range will propane fuel vaporize sufficiently to provide enough fuel pressure for burner operation during flight?

1—0° F to 30° F.
2—30° F to 90° F.
3—10° F to 30° F.
4—0° F to 15° F.

1097. Burner efficiency of a hot-air balloon decreases approximately what percent for each 1,000 ft. above MSL?

1—4 percent.
2—8 percent.
3—15 percent.
4—20 percent.

1098. While in flight, ice begins forming on the outside of the fuel tank in use. This would most likely be caused by

1—water in the fuel.
2—a leak in the fuel line.
3—using the wrong kind of fuel.
4—vaporized fuel instead of liquid fuel being drawn from the tank into the main burner.

1099. The basic purpose of adjusting the fuel/air mixture control at altitude is to

1—decrease the amount of fuel in the mixture in order to compensate for increased air density.
2—decrease the fuel flow in order to compensate for decreased air density.
3—increase the amount of fuel in the mixture to compensate for the decrease in pressure and density of the air.
4—increase the fuel/air ratio for flying at altitude.

1100. While cruising at 9,500 ft. MSL, the fuel/air mixture is properly adjusted. If a descent to 4,500 ft. MSL is made without readjusting the mixture control,

1—the fuel/air mixture may become excessively lean.
2—there will be more fuel in the cylinders than is needed for normal combustion, and the excess fuel will absorb heat and cool the engine.
3—the excessively rich mixture will create higher cylinder head temperatures and may cause detonation.
4—the fuel/air mixture may become excessively rich.

1101. During the runup at a high-elevation airport, a pilot notes a slight engine roughness that is not affected by the magneto check but grows worse during the carburetor heat check. Under these circumstances, which of the following would be the most logical initial action?

1—Check the results obtained with a leaner setting of the mixture control.
2—Taxi back to the flight line for a maintenance check.
3—Reduce manifold pressure to control detonation.
4—Check to see that the mixture control is in the full-rich position.

1102. While in level cruising flight in a helicopter, a pilot experiences low-frequency vibrations (100 to 400 cycles per minute). These vibrations are normally associated with the

1—engine.
2—cooling fan.
3—main rotor.
4—tail rotor.

1103. The primary purpose of the tail rotor system is to

1—assist in making a coordinated turn.
2—maintain heading during forward flight.
3—counteract the torque effect of the main rotor.
4—provide additional thrust and lift.

1104. Select the helicopter component that, if defective, would cause medium-frequency vibrations.

1—Tail rotor.
2—Main rotor.
3—Engine.
4—Transmission.

1105. The proper adjustment to make on the attitude indicator, Figure 10, during level flight is to align the

1—horizon bar to the level-flight indication.
2—horizon bar to the miniature airplane.
3—miniature airplane to the horizon bar.
4—banking indicator to the zero-bank indication.

1106. How should a pilot determine the direction of bank from an attitude indicator such as illustrated in Figure 10?

1—The direction of deflection of the banking scale (A).
2—The direction of deflection of the horizon bar (B).
3—The direction of deflection of the miniature airplane (C).
4—The relationship of the miniature airplane (C) to the deflecting horizon bar (B).

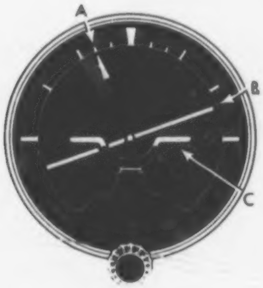


Figure 10

1107. The turn coordinator, Figure 11, provides an indication of

1—the movement of the aircraft about the yaw and roll axes.
2—the angle of bank up to but not exceeding 30°.
3—attitude of the aircraft with reference to the longitudinal axis.
4—motion of the aircraft about the lateral and vertical axes.

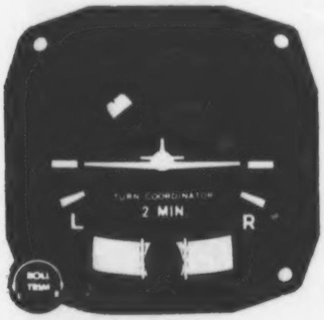


Figure 11

1108. To receive accurate indications during flight from a heading indicator, Figure 12, the instrument must be

1—set prior to flight on a known heading.
2—calibrated on a compass rose at regular intervals.
3—adequately powered so that it seeks the proper direction.
4—periodically realigned with the magnetic compass as the gyro precesses.

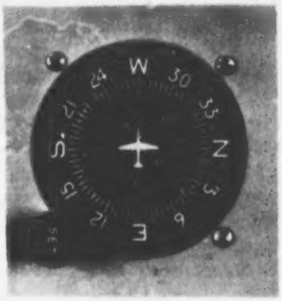


Figure 12

1109. In the Northern Hemisphere, a magnetic compass will normally indicate a turn toward the north if

1—a right turn is entered from an east heading.
2—a left turn is entered from a west heading.
3—an aircraft is decelerated while on an east or west heading.
4—an aircraft is accelerated while on an east or west heading.

1110. In the Northern Hemisphere, if an aircraft is accelerated or decelerated, the magnetic compass will normally indicate

1—a turn momentarily, with changes in airspeed on any heading.
2—correctly when on a north or south heading while either accelerating or decelerating.
3—a turn toward the south while accelerating on a west heading.
4—a turn toward the north while decelerating on an east heading.

1111. In the Northern Hemisphere, if a glider is accelerated or decelerated, the magnetic compass will normally indicate

1—a turn toward north while decelerating on an east heading.
2—correctly only when on a north or south heading.
3—a turn toward south while accelerating on a west heading.
4—a turn momentarily, with changes in airspeed on any heading.

1112. Deviation in a magnetic compass is caused by

1—presence of flaws in the permanent magnets of the compass.
2—the difference in the location between true north and magnetic north.
3—magnetic ore deposits in the Earth distorting the lines of magnetic force.
4—magnetic fields within the aircraft distorting the lines of magnetic force.

1113. In the Northern Hemisphere, the magnetic compass will normally indicate a turn toward the south when

1—a left turn is entered from an east heading.
2—a right turn is entered from a west heading.
3—the aircraft is accelerated while on an east heading.
4—the aircraft is decelerated while on a west heading.

1114. In the Northern Hemisphere, a magnetic compass will normally indicate initially a turn toward the west if

1—an aircraft is decelerated while on a south heading.
2—an aircraft is accelerated while on a north heading.
3—a left turn is entered from a north heading.
4—a right turn is entered from a north heading.

1115. In the Northern Hemisphere, a magnetic compass will normally indicate initially a turn toward the east if

1—an aircraft is decelerated while on a south heading.
2—an aircraft is accelerated while on a north heading.
3—a right turn is entered from a north heading.
4—a left turn is entered from a north heading.

1116. Which of the yaw string and inclinometer illustrations shown in Figure 13, indicate a slipping right turn?

1—C and Z.
2—B and Z.
3—B and X.
4—C and Y.

1117. Which of the illustrations shown in Figure 13, depict the excessive use of right rudder during the entry of a right turn?

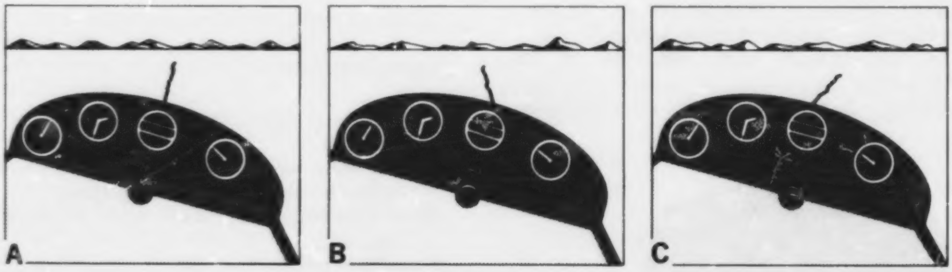
1—B only.
2—B and X.
3—C and X.
4—C and Z.

1118. During flight, when are the indications of a magnetic compass accurate?

1—Only in straight-and-level unaccelerated flight.
2—As long as the airspeed is constant.
3—During turns if the bank does not exceed 18°.
4—In all conditions of flight.

1119. What type of oxygen should be used to replenish an aircraft's oxygen system for high-altitude flights?

1—Medical oxygen.
2—Therapeutic oxygen.
3—Welder's oxygen.
4—Aviation breathing oxygen.



YAW STRINGS

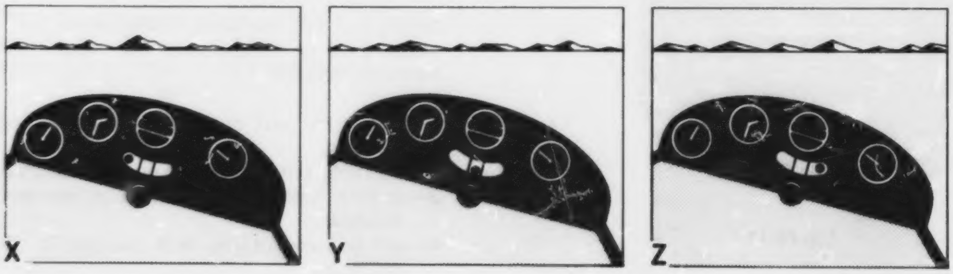


Figure 13

1120. Refer to the color-coded markings on the airspeed indicator in Figure 14. What is the normal flap operating range for the airplane?

1—60 to 100 MPH.
2—65 to 165 MPH.
3—60 to 208 MPH.
4—165 to 208 MPH.

1121. Refer to the color-coded markings on the airspeed indicator in Figure 14. What is the caution range of the airplane?

1—0 to 60 MPH.
2—100 to 165 MPH.
3—165 to 208 MPH.
4—60 to 100 MPH.

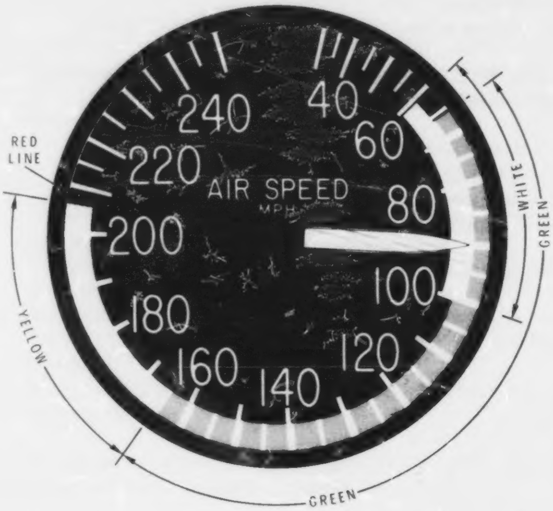


Figure 14

1122. The red line on an airspeed indicator means a maximum airspeed that

1—may be exceeded only if gear and flaps are retracted.
2—may be exceeded if abrupt maneuvers are not attempted.
3—may be exceeded only in smooth air.
4—should not be exceeded.

1123. The pitot system provides impact pressure for only the

1—airspeed indicator, vertical-speed indicator, and altimeter.
2—altimeter and vertical-speed indicator.
3—vertical-speed inicator.
4—airspeed indicator.

1124. Refer to the airspeed indicator in Figure 14. The maximum speed at which the airplane can be operated in smooth air is

1—100 MPH.
2—165 MPH.
3—65 MPH.
4—208 MPH.

1125. Refer to the airspeed indicator in Figure 14. Which of the color-coded markings on the airspeed indicator identifies the never-exceed speed?

1—Lower A/S limit of the yellow arc.
2—Upper A/S limit of the white arc.
3—Upper A/S limit of the green arc.
4—The red radial line.

1126. Refer to the airspeed indicator in Figure 14. Which color-coded marking identifies the power-off stalling speed with flaps and landing gear in the retracted position?

1—Upper A/S limit of the green arc.
2—Upper A/S limit of the white arc.
3—Lower A/S limit of the green arc.
4—Lower A/S limit of the white arc.

1127. Refer to the airspeed indicator in Figure 14. What is the maximum flaps-extended speed?

1—165 MPH.
2—100 MPH.
3—65 MPH.
4—60 MPH.

1128. Refer to the airspeed indicator in Figure 14. Which of the color-coded markings identifies the normal flap operating range?

1—The lower limit of the white arc to the upper limit of the green arc.
2—The green arc.
3—The white arc.
4—The yellow arc.

1129. Refer to the airspeed indicator in Figure 14. Which of the color-coded markings identifies the power-off stalling speed with wing flaps and landing gear in the landing position?

1—Upper A/S limit of the green arc.
2—Upper A/S limit of the white arc.
3—Lower A/S limit of the green arc.
4—Lower A/S limit of the white arc.

1130. Refer to the airspeed indicator in Figure 14. What is the maximum structural cruising speed?

1—100 MPH.
2—165 MPH.
3—208 MPH.
4—65 MPH.

1131. What altitude does altimeter A in Figure 15 indicate?

1—500 ft.
2—1,500 ft.
3—10,500 ft.
4—15,000 ft.

1132. Altimeter B in Figure 15 indicates

1—1,500 ft.
2—4,500 ft.
3—14,500 ft.
4—15,500 ft.

1133. Altimeter C in Figure 15 indicates

1—9,500 ft.
2—10,950 ft.
3—15,940 ft.
4—19,500 ft.

1134. Which altimeter(s) in Figure 15 indicate(s) more than 10,000 ft.?

1—A, B, and C.
2—A and B only.
3—A only.
4—B only.

1135. What is an important airspeed limitation that is not color coded on airspeed indicators?

1—Never-exceed speed.
2—Maximum structural cruising speed.
3—Maneuvering speed.
4—Maximum flaps-extended speed.

1136. If the pitot tube and outside static vents or ports were clogged, which instrument or instruments would be affected?

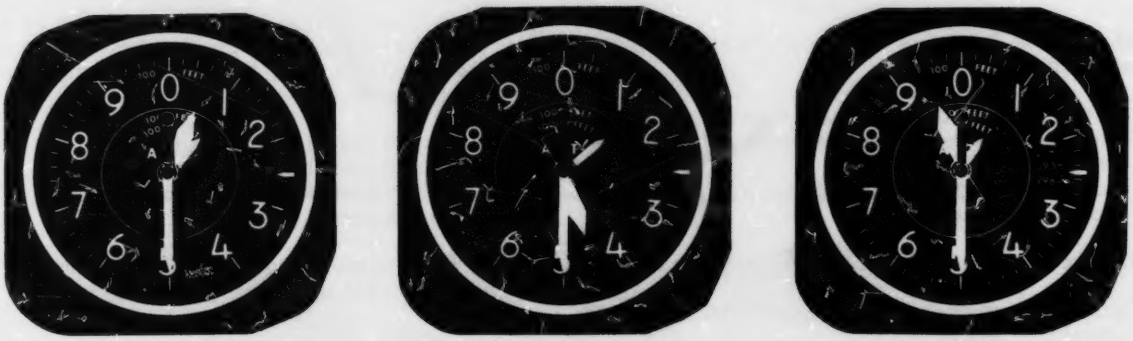
1—The airspeed indicator, altimeter, and turn-and-slip indicator.
2—The altimeter, vertical-speed indicator, and airspeed indicator would provide inaccurate instrument readings.
3—The only instruments that would provide erroneous indications would be the airspeed indicator and altimeter.
4—The airspeed indicator would indicate excessively high airspeeds.

1137. Which instrument(s) will become inoperative if the pitot tube becomes clogged?

1—Altimeter.
2—Vertical speed.
3—Airspeed.
4—Altimeter and airspeed.

1138. Which instrument(s) will become inoperative if the static vents become clogged?

1—Airspeed only.
2—Altimeter only.
3—Airspeed and altimeter only.
4—Airspeed, altimeter, and vertical speed.



A **B** **C**

Figure 15

1139. When the CDI (course deviation indicator) needle is centered during an omnireceiver check using a VOT, the omnibearing selector and the TO/FROM indicator should read

1—180° FROM, only if the pilot is due north of the VOT.
2—0° TO or 180° FROM, regardless of the pilot's position from the VOT.
3—0° FROM or 180° TO, regardless of the pilot's position from the VOT.
4—0° TO, only if the pilot is due south of the VOT.

1140. In relation to the operation of an airship, what is the definition of aerostatics?

1—Aerostatics concerns gravitational factors involving equilibrium of a body freely suspended in the atmosphere.
2—Aerostatics is the science of the dynamics involved in the expansion and contraction of hydrogen gas.
3—Aerostatics concerns the expansion and contraction of the lifting gas helium.
4—Aerostatics concerns the gravitational differences between a body floating in a zero-gravity environment as opposed to the same body in a one-gravity environment.

1141. What is airship superheat?

1—Superheat is a condition of excessive exterior temperature of the envelope.
2—Superheat is when the temperature of the lifting gas exceeds the red line.
3—Superheat is the difference between outside air temperature and the temperature inside the airship envelope.
4—Superheat is a condition of excessive ballonet interior temperature.

1142. Below pressure height, each 5° F of positive superheat amounts to approximately

1—1 percent of gross lift.
2—2 percent of net lift.
3—2 percent of total lift.
4—3 percent of useful lift.

1143. The pressure height of an airship is the altitude at which

1—the airship would be unable to gain more altitude.
2—gas pressure would reach 3 in. of water.
3—both ballonets would be full of air.
4—the lifting gas has expanded sufficiently to empty both ballonets of air.

1144. When the airship is at pressure height and superheat increases, constant pressure must be maintained by valving

1—gas from the envelope.
2—air from the envelope.
3—gas from the ballonets.
4—air from the ballonets.

1145. If an airship in flight is either light or heavy, the unbalanced condition must be overcome by

1—valving air from the ballonets.
2—valving gas from the envelope.
3—a negative or a positive dynamic force.
4—releasing ballast.

1146. During flight in an airship, when is vertical equilibrium established?

1—When buoyancy equals the horizontal equilibrium existing between propeller thrust and airship drag.
2—When buoyancy exceeds the airship weight.
3—When buoyancy is less than airship weight.
4—When buoyancy equals the airship weight.

1147. Under which condition will an airship float in the air?

1—When buoyant force equals horizontal equilibrium existing between propeller thrust and airship drag.
2—When buoyant force is less than the difference between airship weight and the weight of the air volume being displaced.
3—When buoyant force exceeds the variables between airship weight and the weight of air volume being displaced.
4—When buoyant force equals the difference between airship weight and the weight of the air volume being displaced.

1148. The maximum altitude that a rigid airship can reach (under a given atmospheric condition) and then return safely to the surface is determined by

1—the disposable load.
2—ballonet capacity.
3—pressure altitude.
4—lifting gas efficiency.

1149. An airship descending through a steep temperature inversion preparatory to landing will

1—show no change in superheat as altitude is lost.
2—show a decrease in superheat as altitude is lost.
3—become progressively lighter, thus becoming increasingly more difficult to drive down.
4—probably encounter turbulent air near the ground.

1150. The lifting forces which act on a hot-air balloon are primarily the result of the interior air

1—temperature being greater than ambient temperature.
2—temperature being less than ambient temperature.
3—pressure being greater than ambient pressure.
4—pressure being less than ambient pressure.

1151. What is the relationship of false lift with the wind?

1—False lift increases as the wind accelerates the balloon to the same speed as the wind.
2—False lift does not exist if the surface winds are calm.
3—False lift increases if the vertical velocity of the balloon increases.
4—False lift decreases as the wind accelerates the balloon to the same speed as the wind.

1152. What causes false lift which sometimes occurs during launch procedures?

1—Closing the maneuvering vent too rapidly.
2—Excessive temperature within the envelope.
3—Opening the blast valve prematurely during the launch sequence.
4—Venturi effect of the wind on the envelope.

1153. The term to weigh–off as used in ballooning means to determine the

1—amount of sand ballast required for an ascent to a preselected altitude.
2—amount of gas required for an ascent to a preselected altitude.
3—standard weight and balance of the balloon.
4—static equilibrium of the balloon as loaded for flight.

1154. What would cause a gas balloon to start a descent if a cold air mass is encountered and the envelope becomes cooled?

1—A density differential.
2—A barometric pressure differential.
3—The contraction of the gas.
4—The expansion of the gas.

1155. What force provides the forward motion necessary to move a glider through the air?

1—Centrifugal force.
2—Centripetal force.
3—Gravity.
4—Profile drag.

1156. How many feet will a sailplane sink in 15 NM in calm air if its L/D ratio is 22 to 1?

NOTE: 1 NM = approx. 6,000 ft.

1—2,700 ft.
2—3,600 ft.
3—4,100 ft.
4—5,300 ft.

1157. How many feet will a glider sink in 10 NM (approximately 6,000 ft. per mile) in calm air if its L/D ratio is 23 to 1?

1—2,400 ft.
2—2,600 ft.
3—4,300 ft.
4—4,800 ft.

1158. A sailplane has a 23 to 1 glide ratio at 44 MPH in calm air. If this speed is maintained with a direct tailwind of 20 MPH, what would be the approximate glide ratio?

1—26 to 1.
2—30 to 1.
3—33 to 1.
4—42 to 1.

1159. A glider is designed for an L/D ratio of 22 to 1 at 50 MPH in calm air. What would the approximate glide ratio be with a direct headwind of 25 MPH?

1—44 to 1.
2—33 to 1.
3—22 to 1.
4—11 to 1.

1160. A glider has a 20 to 1 glide ratio at 44 MPH in calm air. If this speed is maintained with a direct tailwind of 20 MPH, what would be the approximate glide ratio?

1—26 to 1.
2—29 to 1.
3—31 to 1.
4—33 to 1.

1161. What effect would gusts and turbulence have on the load factor of a glider with changes in airspeed?

1—Decreases as airspeed increases.
2—Increases as airspeed increases.
3—Increases as airspeed decreases.
4—Is constant regardless of changes in airspeed.

1162. The four aerodynamic forces acting on an airplane are

1—power, velocity, gravity, and drag.
2—power, velocity, weight, and friction.
3—thrust, lift, gravity, and weight.
4—thrust, lift, weight, and drag.

1163. When are the four aerodynamic forces that act o an airplane in equilibrium?

1—When the aircraft is at rest on the ground.
2—When the aircraft is accelerating.
3—While the aircraft is decelerating.
4—During unaccelerated flight.

1164. What is the relationship of lift, drag, thrust, ar weight when the airplane is in straight–and–level flight?

1—Lift = drag and thrust = weight.
2—Lift, drag, and weight = thrust.
3—Lift and weight = thrust and drag.
4—Lift = weight and thrust = drag.

1165. What makes an airplane turn?

1—Centrifugal force.
2—Rudder and aileron.
3—Horizontal component of lift.
4—Rudder, aileron, and elevator.

1166. Refer to Figure 16. The acute angle A is the angle of

1—dihedral.
2—attack.
3—camber.
4—incidence.

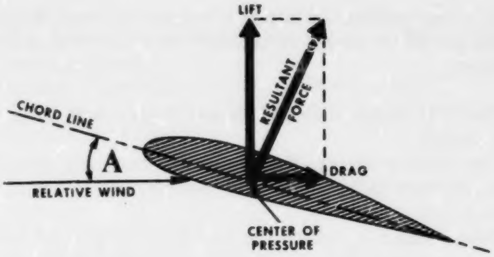


Figure 16

1167. The term angle of attack is defined as the

1—angle between the wing chord line and the direction of the relative wind.
2—angle between the airplane's climb angle and the horizon.
3—angle formed by the longitudinal axis of the airplane and the chord line of the wing.
4—specific angle at which the ratio between lift and drag is the highest.

1168. The part(s) of a balloon that bear(s) the entire load is/are the

1—envelope material.
2—envelope seams.
3—load tapes or cords.
4—basket or burner support.

1169. Refer to Figure 17. If an airplane weighs 2,300 lb., what approximate weight would the airplane structure be required to support during a 60° banked turn while maintaining altitude?

1—3,400 lb.
2—4,600 lb.
3—2,300 lb.
4—5,200 lb.

1170. Refer to Figure 17. If an airplane weighs 3,300 lb., what approximate weight would the airplane structure be required to support during a 30° banked turn while maintaining altitude?

1—3,100 lb.
2—3,960 lb.
3—1,200 lb.
4—7,220 lb.

1171. Refer to Figure 17. If an airplane weighs 5,400 lb., what approximate weight would the airplane structure be required to support during a 55° banked turn while maintaining altitude?

1—5,400 lb.
2—6,720 lb.
3—9,180 lb.
4—10,800 lb.

1172. Refer to Figure 17. The maximum bank that could be made during a level turn without exceeding the maximum positive load factor of a utility category airplane (+4.4 G units) is

1—71°.
2—73°.
3—77°.
4—83°.

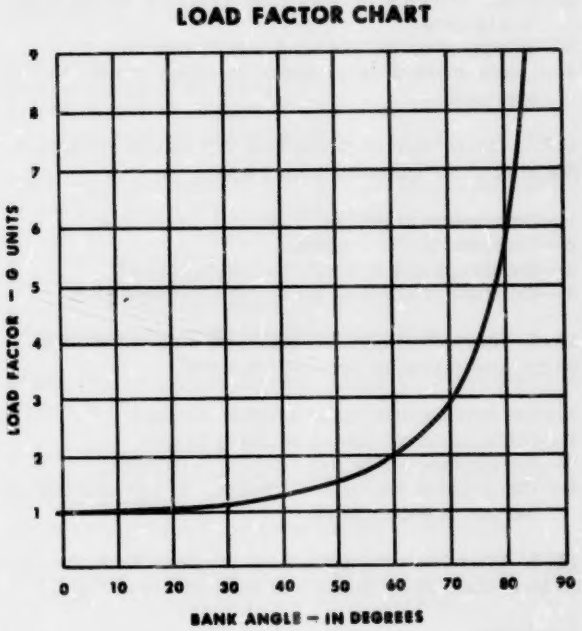


Figure 17

1173. The left turning tendency of an airplane caused by P-factor is the result of the

1—clockwise rotation of the engine and the propeller turning the airplane counterclockwise.
2—propeller blade descending on the right, producing more thrust than the ascending blade on the left.
3—gyroscopic forces applied to the rotating propeller blades acting 90° in advance of the point the force was applied.
4—spiral characteristics of the slipstream air being forced rearward by the rotating propeller.

1174. One of the main purposes of using flaps during the approach and landing is to

1—decrease lift, thus enabling a steeper–than–normal approach to be made.
2—increase the angle of descent without increasing airspeed.
3—permit a touchdown at a higher indicated airspeed.
4—decrease the angle of descent without increasing the airspeed.

1175. The purpose of the rudder on an airplane is to

1—control the yaw.
2—control the overbanking tendency.
3—maintain a crab angle to control drift.
4—maintain the turn after the airplane is banked.

1176. The purpose of wing flaps is to

1—enable the pilot to make steeper approaches to a landing without increasing airspeed.
2—enable the pilot to reduce the speed for the approach to a landing.
3—enlarge or control the wing area to vary the lift.
4—create more drag in order to utilize power on the approach.

1177. The amount of excess load that can be imposed on the wing of an airplane depends upon

1—the position of the CG.
2—the speed of the airplane.
3—the abruptness at which the load is applied.
4—the angle of attack at which the airplane will stall.

1178. What effect does an increased load factor have on an airplane during an approach to a stall?

1—The airplane will stall at a higher airspeed.
2—The airplane will have a tendency to spin.
3—The airplane will be more difficult to control.
4—The airplane will have a tendency to yaw and roll as the stall is encountered.

1179. Which basic flight maneuver increases the load factor on an airplane as compared to straight–and–level flight?

1—Climbs.
2—Turns.
3—Stalls.
4—Slips.

1180. What is one advantage of an airplane said to be inherently stable?

1—The airplane will not spin.
2—The airplane will be difficult to stall.
3—The airplane will require less effort to control.
4—The airplane will not overbank during steep turns.

1181. What determines the longitudinal stability of an airplane?

1—The location of the CG with respect to the center of lift.
2—The effectiveness of the horizontal stabilizer, rudder, and rudder trim tab.
3—The relationship of thrust and lift to weight and drag.
4—The dihedral, angle of sweepback, and the keel effect.

1182. What causes an airplane (except a T–tail) to pitch nosedown when power is reduced and controls are not adjusted?

1—The CG shifts forward when thrust and drag are reduced.
2—The downwash on the elevators from the propeller slipstream is reduced and elevator effectiveness is reduced.
3—When thrust is reduced to less than weight, lift is also reduced and the wings can no longer support the weight.
4—The upwash on the wings from the propeller slipstream is reduced and angle of attack is reduced.

1183. An airplane has been loaded in such a manner that the CG is located aft of the CG limit. One undesirable flight characteristic a pilot might experience with this airplane would be

1—a longer takeoff run.
2—the inability to recover from a stalled condition.
3—stalling at higher–than–normal airspeed.
4—the inability to flare during landings.

1184. What effect does loading an airplane to the most aft CG have on airplane stability?

1—The airplane will be less stable at slow speeds, but more stable at high speeds.
2—The airplane will be less stable at high speeds, but more stable at low speeds.
3—The airplane will be more stable at all speeds.
4—The airplane will be less stable at all speeds.

1185. Frost which has not been removed from the wings of an airplane before flight

1—may cause the airplane to become airborne with a lower angle of attack and at a lower indicated airspeed.
2—may make it difficult or impossible to become airborne.
3—would present no problems since frost will blow off when the airplane starts moving during takeoff.
4—will change the camber (curvature of the wing) thereby increasing lift during takeoff.

1186. P–factor or asymmetric propeller loading causes the airplane to

1—be unstable around the lateral axis.
2—yaw to the left when at high angles of attack.
3—yaw to the left when at high speeds.
4—be unstable around the vertical and lateral axes.

1187. In what airspeed and power condition is torque effect the greatest in a single-engine airplane?

1—Low airspeed, high power.
2—Low airspeed, low power.
3—High airspeed, high power.
4—High airspeed, low power.

1188. Under what conditions can an airplane be stalled?

1—Only when the nose is high and the airspeed is low.
2—Only when the airspeed decreases to the published stalling speed.
3—At any airspeed and in any flight attitude.
4—Only when the nose is too high in relation to the horizon.

1189. The angle of attack at which an airplane wing stalls will

1—increase if the CG is moved forward.
2—change with an increase in gross weight.
3—remain the same regardless of gross weight.
4—decrease if the CG is moved aft.

1190. As altitude increases, the indicated airspeed at which a given airplane stalls in a particular configuration will

1—decrease as the true airspeed decreases.
2—decrease as the true airspeed increases.
3—remain the same as at low altitude.
4—increase because the air density becomes less.

1191. In what flight condition must an airplane be placed in order to spin?

1—Partially stalled with one wing low and the throttle closed.
2—Placed in a steep diving spiral.
3—Stalled.
4—Placed in a steep nose-high pitch attitude.

1192. The phenomenon of ground effect is most likely to result in which problem in an airplane?

1—Settling back to the surface abruptly immediately after becoming airborne.
2—Becoming airborne before reaching recommended takeoff speed.
3—Inability to get airborne even though airspeed is sufficient for normal takeoff needs.
4—A rapid rate of sink and absence of normal cushioning during landings.

1193. Which adverse effect must a pilot be aware of as a result of the phenomenon of ground effect during takeoff?

1—Difficulty in getting airborne even though airspeed is sufficient for normal takeoff.
2—Becoming airborne before reaching recommended takeoff speed.
3—Settling back to the surface abruptly immediately after becoming airborne.
4—Difficulty in climbing the first 20 ft. after takeoff.

1194. The effect of floating caused by the phenomenon of ground effect will be most realized during an approach to land when

1—at less than the length of the airplane's wingspan above the surface.
2—at twice the length of the airplane's wingspan above the surface.
3—a higher-than-normal angle of attack is used.
4—at speeds approaching a stall.

1195. An airplane is usually affected by ground effect at what height above the surface?

1—Between 100 and 200 ft. above the surface in calm wind conditions.
2—Less than half of the airplane's wingspan above the surface.
3—Twice the length of the airplane's wingspan above the surface.
4—Three or four times the airplane's wingspan.

1196. Angle of attack is defined as the angle between the chord line of an airfoil and the

1—horizon.
2—pitch angle of an airfoil.
3—rotor plane of rotation.
4—direction of the relative wind.

1197. High airspeeds in turbulent air should be avoided primarily because of the possibility of

1—an abrupt pitchup.
2—retreating blade stall.
3—a low-frequency vibration developing.
4—excessive stress on the advancing blade.

1198. The maximum forward speed of a gyroplane is limited by the

1—retreating blade stall.
2—rotor RPM red line established by the manufacturer.
3—solidity ratio.
4—centrifugal twisting moment of the rotor blades.

1199. When operating at high forward airspeeds, stalls are more likely to occur under which condition?

1—Low gross weight and low density altitude.
2—High RPM and low density altitude.
3—Steep turns in turbulent air.
4—A descent at high RPM.

1200. Translational lift is the result of

1—groundspeed.
2—airspeed.
3—both airspeed and groundspeed.
4—ground effect.

1201. During a hover, a helicopter tends to drift in the direction of tail rotor thrust. What is this movement called?

1—Gyroscopic precession.
2—Transverse flow effect.
3—Translating tendency.
4—Coriolis force.

1202. The upward bending of the rotor blades resulting from the combined forces of lift and centrifugal force is known as

1—blade flapping.
2—Coriolis effect.
3—dissymmetry of lift.
4—coning.

1203. The purpose of the lead–lag (drag) hinge in a three–bladed, fully articulated helicopter rotor system is to compensate for

1—Coriolis effect.
2—lateral instability during autorotation.
3—geometric unbalance.
4—dissymmetry of lift.

1204. As each blade flaps up and down, it produces a shift of the center of its mass. When the blade flaps up, the CG moves closer to its axis of rotation, giving that blade a tendency to

1—decelerate its rotational velocity; this tendency is known as drag effect.
2—accelerate its rotational velocity; this tendency is known as Coriolis effect.
3—stabilize its rotational velocity, thus compensating for dissymmetry of lift.
4—decelerate its rotational velocity; this tendency is known as translating tendency.

1205. The lift differential that exists between the advancing main rotor blade and the retreating main rotor blade is known as

1—Coriolis effect.
2—dissymmetry of lift.
3—translating tendency.
4—translational lift.

1206. Refer to Figure 18. During flight, if cyclic control pressure is applied which results in a maximum increase in pitch angle of the rotor blade at position A, the rotor disc will tilt

1—forward.
2—aft.
3—left.
4—right.

1207. Ground resonance is most likely to develop when

1—there is a sudden change in blade velocity in the plane of rotation.
2—a series of shocks causes the rotor system to become unbalanced.
3—there is a combination of a decrease in the angle of attack on the advancing blade and an increase in the angle of attack on the retreating blade.
4—initial ground contact is made with a combination of high gross weight and low RPM.

1208. During forward cruising flight at constant airspeed and altitude, the individual rotor blades, when compared to each other, are operating at

1—unequal airspeed, equal angles of attack, and unequal lift moment.
2—constant airspeed, unequal angles of attack, and unequal lift moment.
3—unequal airspeed, unequal angles of attack, and equal lift moment.
4—constant airspeed, equal angles of attack, and equal lift moment.

1209. Which of the following items are included in the basic empty weight of an airplane?

1—Hydraulic fluid and usable fuel.
2—Only the airframe, powerplant, and equipmen installed by the manufacturer.
3—Full fuel tanks and engine oil to capacity, bu excluding crew and baggage.
4—Unusable fuel and optional equipment.

1210. An aircraft is loaded 110 lb. over maximu certificated gross weight. If fuel (gasoline) is drained t bring the aircraft weight within limits, how much fue should be drained?

1—16.2 gal.
2—18.4 gal.
3—15.7 gal.
4—17.1 gal.

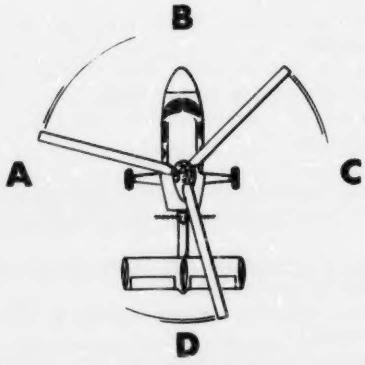


Figure 18

1211. If an aircraft is loaded 90 lb. over maximum certificated gross weight and fuel (gasoline) is drained to bring the aircraft weight within limits, how much fuel should be drained?

1—9 gal.
2—12 gal.
3—6 gal.
4—15 gal.

1212. A pilot plans to fly solo in the front seat of a two-place glider which displays the following placards on the instrument panel.

MINIMUM PILOT WEIGHT: 135 lb.
MAXIMUM PILOT WEIGHT: 220 lb.

NOTE: Seat ballast should be used as necessary.

The recommended towing speed for all tows is 55 – 65 MPH.

What action should be taken if the pilot's weight is 115 lb.?

1—Use a towing speed of 55 MPH.
2—Add 55 lb. of seat ballast to obtain the average pilot weight of 170 lb.
3—Add 20 lb. of seat ballast.
4—Adjust the elevator trim to the nose–up position.

1213. A pilot plans to fly solo in the front seat of a two-place glider which displays the following placards on the instrument panel.

MINIMUM PILOT WEIGHT: 135 lb.
MAXIMUM PILOT WEIGHT: 220 lb.

NOTE: Seat ballast should be used as necessary.

The recommended towing speed for all tows is 55 – 65 MPH.

What action should be taken if the pilot's weight is 125 lb.?

1—Use a towing speed of 55 MPH.
2—Add 45 lb. of seat ballast to obtain the average pilot weight of 170 lb.
3—Adjust the elevator trim tab to the nose–up position.
4—Add 10 lb. of seat ballast.

1214. GIVEN:

	WEIGHT (LB.)	ARM (IN.)	MOMENT (LB./IN.)
Empty weight	1,495.0	101.4	151,593.0
Pilot and passengers	380.0	64.0	---
Fuel (30 gal. usable no reserve)	---	96.0	---

The CG is located how far aft of datum?

1—92.44.
2—94.01.
3—119.8.
4—135.0.

1215. Determine the weight and balance of the helicopter using the chart in Figure 19.

	WEIGHT (LB.)	ARM (IN.)	MOMENT (LB./IN.)
Empty weight	1,495.0	---	151,593.0
Pilot and one passenger	350.0	64.0	---
Fuel (40 gal. usable)	---	96.0	---

1—Within gross weight limit, but exceeds aft CG limit.
2—Over gross weight limit, but within CG limit.
3—Within gross weight limit and at the aft CG limit.
4—Over gross weight limit and exceeds the aft CG limit.

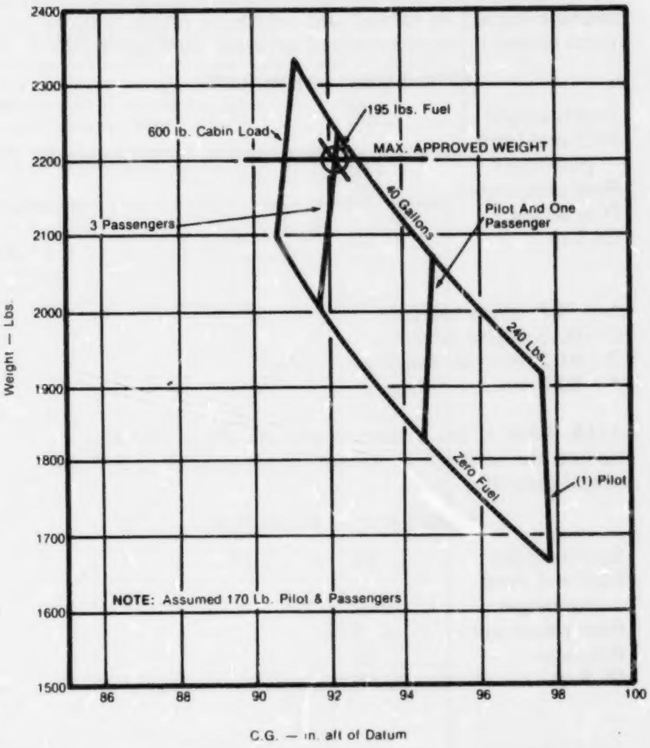


Figure 19

1216. What is the maximum amount of baggage that may be loaded aboard the airplane for the CG to remain within the loading envelope? (See Figure 20.)

	WEIGHT (LB.)	MOM/1000
Empty weight	1,350	51.5
Pilot and front passenger	250	---
Rear passengers	400	---
Baggage	---	---
Fuel 30 gal.	---	---
Oil 8 qt.	15	-0.2

1—120 lb.
2—105 lb.
3—90 lb.
4—75 lb.

1217. Calculate the loaded aircraft moment/1000 of the airplane loaded as follows and determine which category when plotted on the CG moment envelope. (See Figure 20.)

	WEIGHT (LB.)	MOM/1000
Empty weight	1,350	51.5
Pilot and front passenger	310	---
Rear passengers	96	---
Fuel 38 gal.	---	---
Oil 8 qt.	15	-0.2

1—79.2, utility category.
2—80.8, utility category.
3—81.2, normal category.
4—82.0, normal category.

1218. What is the maximum amount of fuel that may be aboard the airplane on takeoff if it is loaded as follows? (See Figure 20.)

	WEIGHT (LB.)	MOM/1000
Empty weight	1,350	51.5
Pilot and front passenger	340	---
Rear passengers	310	---
Baggage	45	---
Oil 8 qt.	15	---

1—24 gal.
2—34 gal.
3—40 gal.
4—46 gal.

1219. Determine the CG moment/1000 with the following data using the graphs in Figure 20.

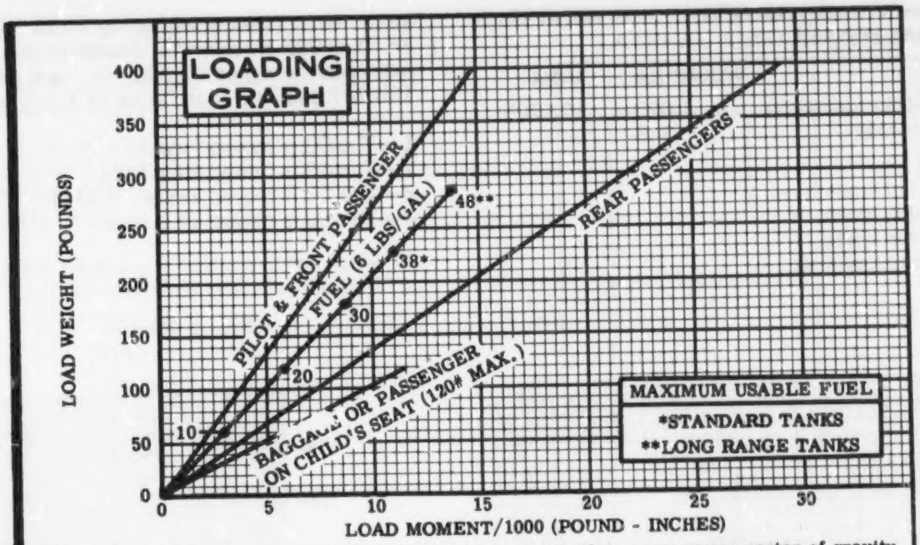
	WEIGHT (LB.)	MOM/1000
Empty weight	1,350	51.5
Pilot and front passenger	340	---
Fuel (std. tanks)	Capacity	---
Oil 8 qt.	15	-0.2

1—38.7 lb./in.
2—69.9 lb./in.
3—74.9 lb./in.
4—77.0 lb./in.

1220. Calculate the CG and determine the plotted position on the CG moment envelope chart, Figure 20.

	WEIGHT (LB.)	MOM/1000
Empty weight	1,350	51.5
Pilot and front passenger	380	---
Fuel 48 gal.	288	---
Oil 8 qt.	15	-0.2

1—CG 38.9, out of limits forward.
2—CG 39.9, utility category.
3—CG 38.9, normal category.
4—CG 39.9, normal category.



NOTES: (1) Lines representing adjustable seats show the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements diagram for forward and aft limits of occupant c.g. range.

(2) Engine Oil: 8 Qts. = 15 Lbs. at -0.2 Moment/1000.

NOTE: The empty weight of this airplane does not include the weight of the oil.

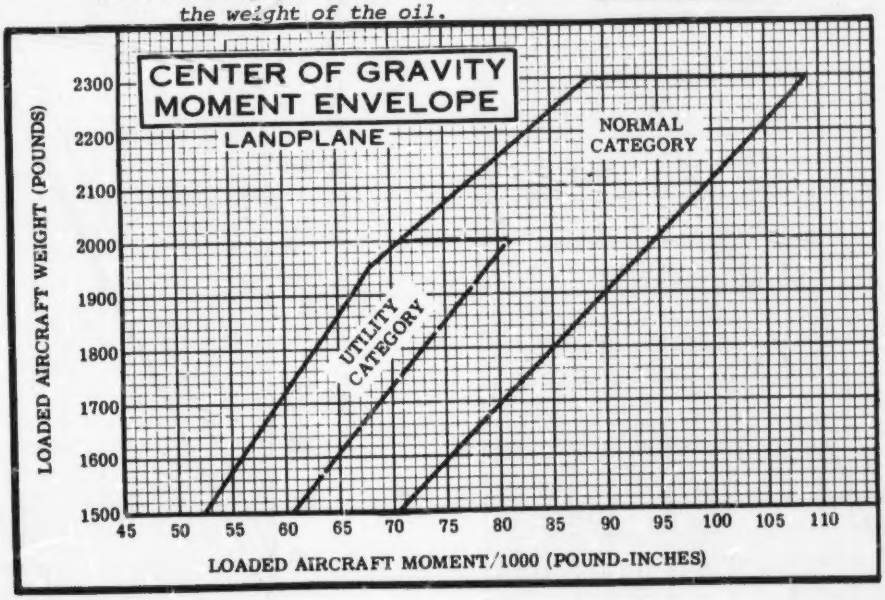


Figure 20

1221. Determine if the helicopter's CG is within limits using the charts in Figure 21.

	WEIGHT (LB.)	MOM
Empty weight (including oil)	1,025	102,705
Pilot and passenger	345	---
Fuel, 35 gal.	---	---

1—96.73, out of limits forward.
2—97.06, within limits.
3—97.54, within limits.
4—97.88, out of limits aft.

1222. What effect does adding a 185 lb. passenger have on the CG, if prior to boarding the passenger, the helicopter weighed 1,380 lb. and the moment is 136,647.5 lb./in.? (See Figure 21.)

1—The CG is moved forward 1.78 in.
2—The CG is moved aft 1.78 in.
3—The CG is moved forward 2.36 in.
4—The CG is moved aft 2.36 in.

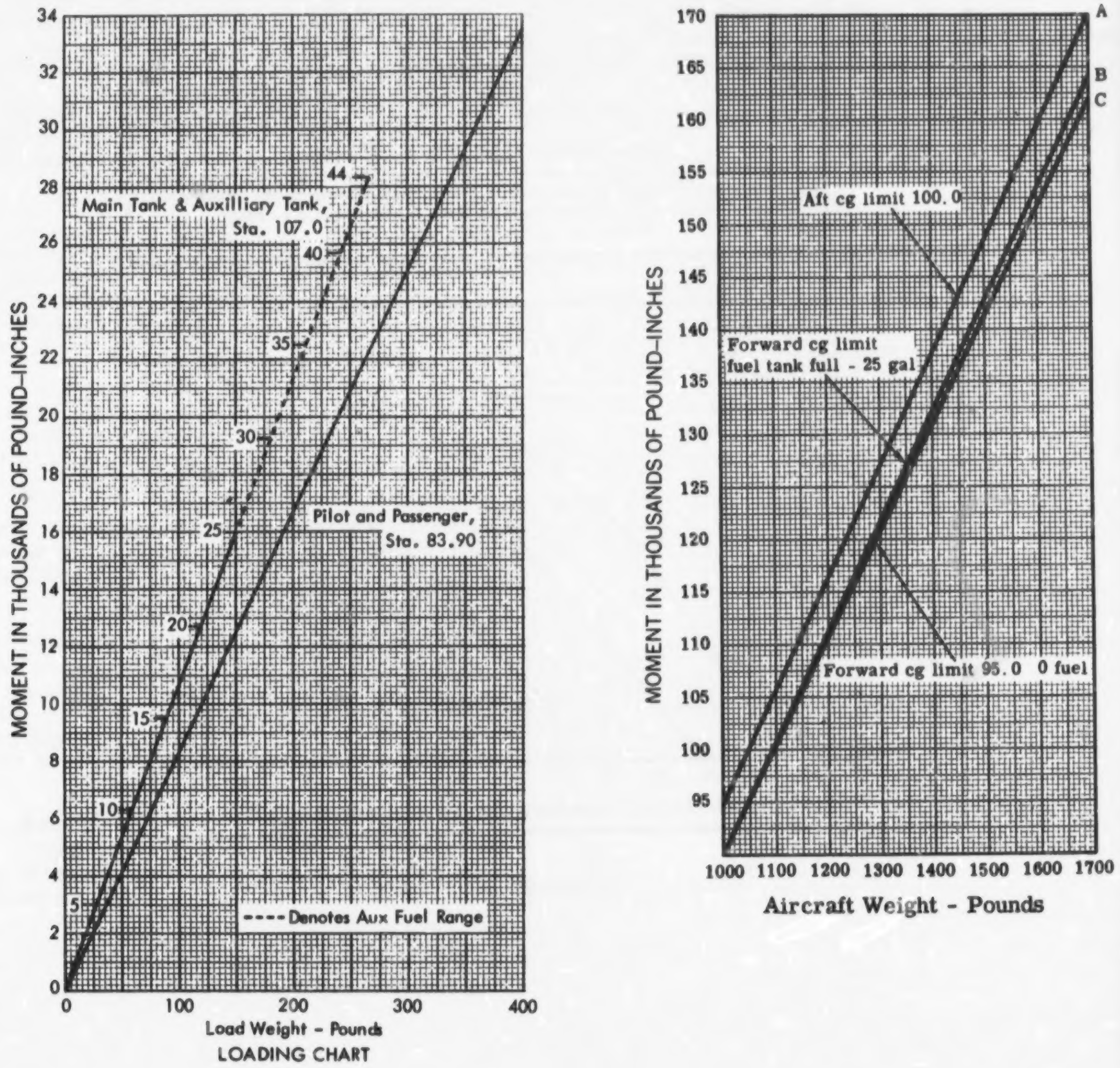


Figure 21

1223. How is the CG of the helicopter affected when all of the auxiliary fuel is burned off? (See Figure 21.)

Gross weight prior to fuel burn — 1,660 lb. and moment of 159,898.5 lb./in.

1—No effect.
2—CG moves forward 0.78 in.
3—CG moves forward 1.07 in.
4—CG moves aft 0.78 in.

1224. Calculate the weight and balance of the helicopter, and determine if the CG is within limits. (See Figure 22.)

	WEIGHT (LB.)	**ARM (IN.)**	**MOM/ 100**
Empty weight	1,495.0	101.4	1,515.93
Oil, 8 qt.	---	100.5	---
Fuel, 40 gal.	---	96.0	---
Pilot	160.0	64.0	---

1—90.48 in., out of limits forward.
2—95.32 in., within limits.
3—97.58 in., within limits.
4—99.15 in., out of limits aft.

1225. Determine if the helicopter weight and balance is within limits by reference to the chart in Figure 22.

	WEIGHT (LB.)	**ARM (IN.)**	**MOM/ 100**
Empty weight	1,495.0	101.4	1,515.93
Oil, 8 qt.	---	100.5	---
Fuel, 40 gal.	---	96.0	---
Pilot and copilot	300.0	64.0	---

1—CG, 95.2 in., within limits.
2—CG, 95.3 in., weight and CG out of limits.
3—CG, 95.4 in., within limits.
4—CG, 95.5 in., weight out of limits.

1226. What action, if any, should be taken for lateral balance if the helicopter is loaded as follows? (See Figure 22.)

Gross weight — 1,800 lb.
Pilot — 140 lb., 13.5 in. left of "0" MOM arm
Copilot — 180 lb., 13.5 in. right of "0" MOM arm

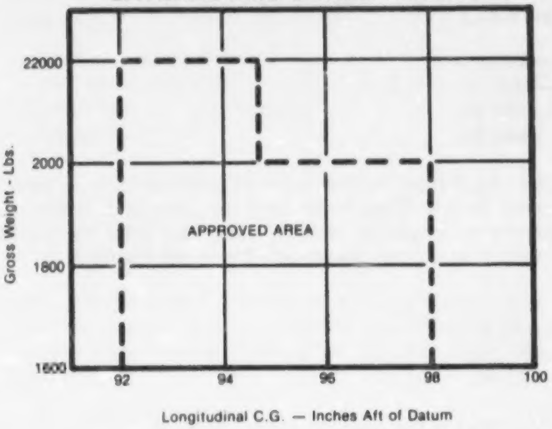
1—No action is required.
2—Add 10 lb. of weight to the pilot's side.
3—Decrease the gross weight 50 lb.
4—Shift at least 25 lb. to the copilot's side.

1227. What action, if any, should be taken for lateral balance if the helicopter is loaded as follows? (See Figure 22.)

Gross weight — 1,800 lb.
Pilot — 130 lb., 13.5 in. left of "0" MOM arm
Copilot — 200 lb., 13.5 in. right of "0" MOM arm

1—No action is required.
2—Add 10 lb. of weight to the pilot's side.
3—Decrease the gross weight 50 lb.
4—Shift at least 25 lb. to the copilot's side.

APPROVED CENTER OF GRAVITY ENVELOPES
LATERAL AND LONGITUDINAL



LATERAL OFFSET MOMENT ENVELOPE

NOTE APPLICABLE TO MODELS F 28C & 280C

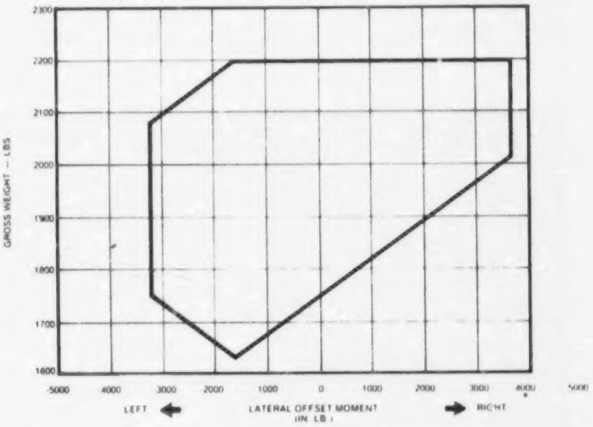


Figure 22

1228. Determine the maximum payload for a flight at 2,500 ft. at an ambient temperature of 91° F. (See Figure 23.)

1—420 lb.
2—465 lb.
3—505 lb.
4—840 lb.

1229. What maximum amount of propane may be taken aboard for a flight with two persons and carry-on equipment weighing 481 lb. and be able to attain 10,000 ft. at a temperature of 40° F? (See Figure 23.)

1—10 gal.
2—15 gal.
3—20 gal.
4—30 gal.

1230. What is the maximum altitude for the balloon if the gross weight is 1,100 lb. and standard temperature exists at all altitudes? (See Figure 23.)

1—1,000 ft.
2—4,000 ft.
3—5,500 ft.
4—11,000 ft.

1231. What is the maximum weight allowed for pilot and passengers for a flight at 5,000 ft. with a standard temperature? Launch with 20 gal. of propane. (See Figure 23.)

1—625 lb.
2—670 lb.
3—760 lb.
4—1,095 lb.

1232. Determine the maximum weight allowable for pilot and passenger for a flight at approximately 1,000 ft. with a temperature of 68° F. Launch with 20 gal. of propane. (See Figure 23.)

1—600 lb.
2—620 lb.
3—654 lb.
4—678 lb.

1233. What is the maximum altitude for the balloon if the gross weight is 1,000 lb. and standard temperature exists at all altitudes? (See Figure 23.)

1—1,000 ft.
2—4,000 ft.
3—5,500 ft.
4—11,000 ft.

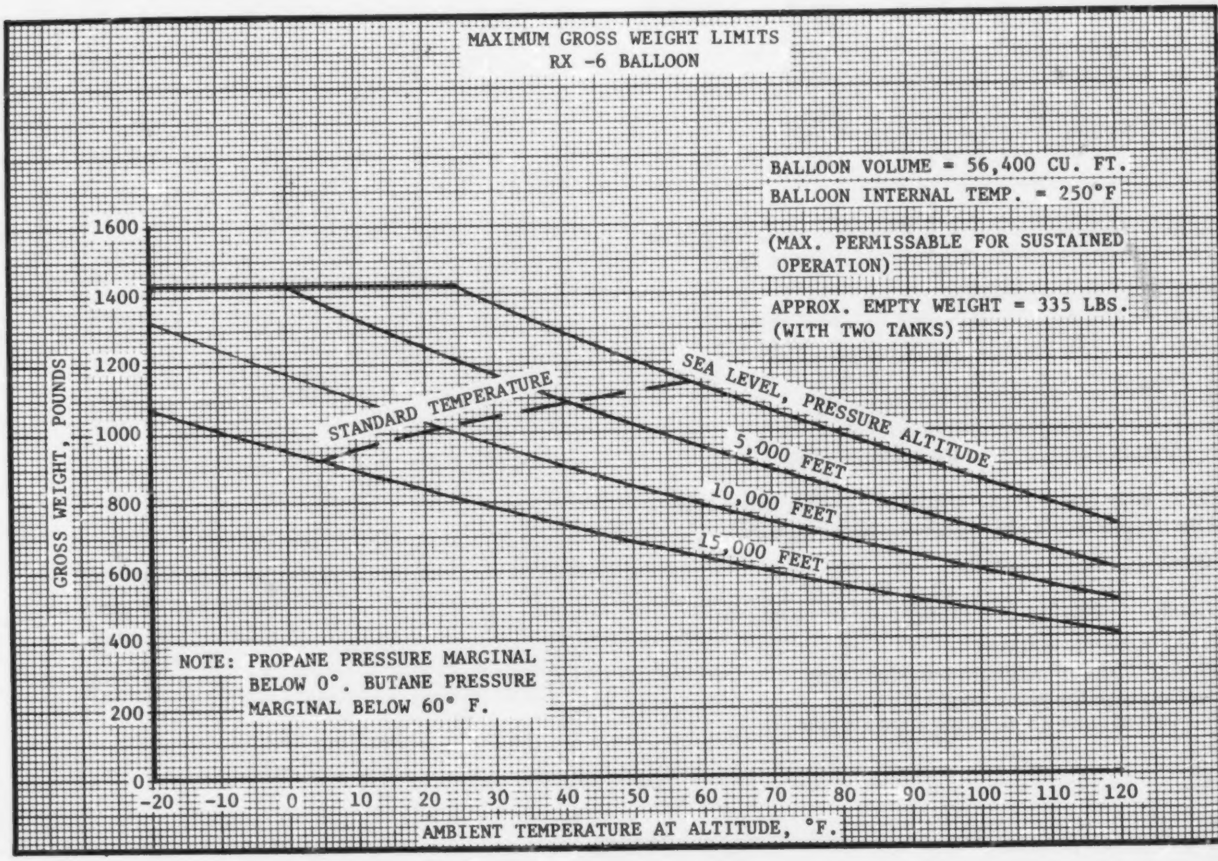


Figure 23

1234. How is the CG of the helicopter affected after a fuel burn of 20 gal. (arm 96.0)?

Gross weight prior to fuel burn – 2,050 lb. and moment of 195,341 lb./in.

1—CG shifts forward 1.0 in.
2—CG shifts forward 0.1 in.
3—CG shifts aft 1.0 in.
4—CG shifts aft 0.1 in.

1235. Determine if the airplane weight and balance is within limits. (See Figure 24 on page 32, and Figure 25 on page 33.)

Front seat occupants	340 lb.
Rear seat occupants	295 lb.
Fuel	44 gal.
Baggage	56 lb.

1—Within limits.
2—20 lb. overweight, CG within limits.
3—Weight within limits, CG out of limits forward.
4—39 lb. overweight, CG out of limits forward.

1236. Which is the maximum amount of baggage that can be carried when the airplane is loaded as follows? (See Figure 24 on page 32, and Figure 25 on page 33.)

Front seat occupants	387 lb.
Rear seat occupants	293 lb.
Fuel	35 gal.

1—45 lb.
2—63 lb.
3—220 lb.
4—255 lb.

1237. Calculate the weight and balance and determine if the CG and the weight of the airplane are within limits. (See Figure 24 on page 32, and Figure 25 on page 33.)

Front seat occupants	350 lb.
Rear seat occupants	325 lb.
Baggage	27 lb.
Fuel	35 gal.

1—81.7, out of limits forward.
2—83.4, within limits.
3—84.1, within limits.
4—84.8, out of limits aft.

1238. Upon landing, the front passenger (180 lb.) departs the airplane. A rear passenger (204 lb.) moves to the front passenger position. What effect does this have on the CG if the airplane weighed 2,690 lb. and the MOM/100 was 2,260 just prior to the passenger transfer? (See Figure 24 on page 32, and Figure 25 on page 33.)

1—The weight changes but the CG is not affected.
2—The CG moves forward approximately 0.1 in.
3—The CG moves forward approximately 2.4 in.
4—The CG moves forward approximately 3 in.

1239. Determine if the airplane weight and balance is within limits. (See Figure 24 on page 32, and Figure 25 on page 33.)

Front seat occupants	415 lb.
Rear seat occupants	110 lb.
Fuel, main and aux. tanks	63 gal.
Baggage	32 lb.

1—19 lb. overweight, CG within limits.
2—19 lb. overweight, CG out of limits forward.
3—Weight within limits, CG out of limits.
4—Weight and balance within limits.

1240. Which action can adjust the airplane's weight to maximum gross weight and the CG within limits for takeoff? (See Figure 24 on page 32, and Figure 25 on page 33.)

Front seat occupants	425 lb.
Rear seat occupants	300 lb.
Fuel, main tanks	44 gal.

1—Drain 12 gal. of fuel.
2—Drain 9 gal. of fuel.
3—Transfer 12 gal. of fuel from the main tanks to the auxiliary tanks.
4—Transfer 19 gal. of fuel from the main tanks to the auxiliary tanks.

1241. With the airplane loaded as follows, what action can be taken to balance the airplane? (See Figure 24 on page 32, and Figure 25 on page 33.)

Front seat occupants	400 lb.
Main wing tanks	44 gal.

1—Drain 10 gal. of fuel.
2—Fill the auxiliary wing tanks.
3—Transfer 10 gal. of fuel from the main tanks to the auxiliary tanks.
4—Add a 100–pound weight to the baggage compartment.

1242. What effect does a 35–gallon fuel burn have on the weight and balance if the airplane weighed 2,890 lb. and the MOM/100 was 2,452 at takeoff? (See Figure 24 on page 32, and Figure 25 on page 33.)

1—Weight is reduced by 210 lb. and the CG is unaffected.
2—Weight is reduced to 2,680 lb. and the CG moves forward.
3—Weight is reduced to 2,855 lb. and the CG moves aft.
4—Weight is reduced by 210 lb. and the CG is aft of limits.

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

FRONT SEATS ARM 85		REAR SEATS ARM 121	
Weight	Moment/100	Weight	Moment/100
120	102	120	145
130	110	130	157
140	119	140	169
150	128	150	182
160	136	160	194
170	144	170	206
180	153	180	218
190	162	190	230
200	170	200	242

BAGGAGE OR 5TH SEAT OCCUPANT ARM 140

Weight	Moment/100
10	14
20	28
30	42
40	56
50	70
60	84
70	98
80	112
90	126
100	140
110	154
120	168
130	182
140	196
150	210
160	224
170	238
180	252
190	266
200	280
210	294
220	308
230	322
240	336
250	350
260	364
270	378

USABLE FUEL

MAIN WING TANKS ARM 75		
Gallons	Weight	Moment/100
5	30	22
10	60	45
15	90	68
20	120	90
25	150	112
30	180	135
35	210	158
40	240	180
44	264	198

AUXILIARY WING TANKS ARM 94

Gallons	Weight	Moment/100
5	30	28
10	60	56
15	90	85
19	114	107

*OIL

Quarts	Weight	Moment/100
10	19	5

*Included in Basic Empty Weight

Empty Weight - 2015

MOM/ 100 - 1554

MOMENT LIMITS vs WEIGHT

Moment limits are based on the following weight and center of gravity limit data (landing gear down).

WEIGHT CONDITION	FORWARD CG LIMIT	AFT CG LIMIT
2950 lb. (take-off or landing)	82.1	84.7
2525 lb.	77.5	85.7
2475 lb. or less	77.0	85.7

Figure 24

MOMENT LIMITS vs WEIGHT (Continued)

Weight	Minimum Moment / 100	Maximum Moment / 100
2100	1617	1800
2110	1625	1808
2120	1632	1817
2130	1640	1825
2140	1648	1834
2150	1656	1843
2160	1663	1851
2170	1671	1860
2180	1679	1868
2190	1686	1877
2200	1694	1885
2210	1702	1894
2220	1709	1903
2230	1717	1911
2240	1725	1920
2250	1733	1928
2260	1740	1937
2270	1748	1945
2280	1756	1954
2290	1763	1963
2300	1771	1971
2310	1779	1980
2320	1786	1988
2330	1794	1997
2340	1802	2005
2350	1810	2014
2360	1817	2023
2370	1825	2031
2380	1833	2040
2390	1840	2048
2400	1848	2057
2410	1856	2065
2420	1863	2074
2430	1871	2083
2440	1879	2091
2450	1887	2100
2460	1894	2108
2470	1902	2117
2480	1911	2125
2490	1921	2134
2500	1932	2143
2510	1942	2151
2520	1953	2160
2530	1963	2168
2540	1974	2176
2550	1984	2184
2560	1995	2192
2570	2005	2200
2580	2016	2208
2590	2026	2216

Weight	Minimum Moment / 100	Maximum Moment / 100
2600	2037	2224
2610	2048	2232
2620	2058	2239
2630	2069	2247
2640	2080	2255
2650	2090	2263
2660	2101	2271
2670	2112	2279
2680	2123	2287
2690	2133	2295
2700	2144	2303
2710	2155	2311
2720	2166	2319
2730	2177	2326
2740	2188	2334
2750	2199	2342
2760	2210	2350
2770	2221	2358
2780	2232	2366
2790	2243	2374
2800	2254	2381
2810	2265	2389
2820	2276	2397
2830	2287	2405
2840	2298	2413
2850	2309	2421
2860	2320	2428
2870	2332	2436
2880	2343	2444
2890	2354	2452
2900	2365	2460
2910	2377	2468
2920	2388	2475
2930	2399	2483
2940	2411	2491
2950	2422	2499

Figure 25

1243. Calculate the weight and balance of the glider, and determine if the CG is within limits. (See Figure 26.)

Pilot (fwd. seat) — 160 lb.
Passenger (aft seat) — 185 lb.

1—CG, 71.65 in. aft of datum — out of limits forward.
2—CG, 79.67 in. aft of datum — within limits.
3—CG, 83.43 in. aft of datum — within limits.
4—CG, 84.91 in. aft of datum — within limits.

1244. What is the CG of the glider if the pilot and passenger each weigh 170 lb.? (See Figure 26.)

1—77.62 in. aft of datum.
2—78.25 in. aft of datum.
3—83.15 in. aft of datum.
4—88.57 in. aft of datum.

1245. How is the CG affected if radio and oxygen equipment weighing 35 lb. is added at station 43.8? The glider weighs 945 lb. with a moment of 78,000.2 lb./in. prior to adding the equipment. (See Figure 26.)

1—CG shifts forward 0.79 in.
2—CG shifts forward 1.38 in.
3—CG shifts aft 1.38 in.
4—CG shifts aft 0.79 in.

1246. What is the new condition of the gyroplane CG after a 10 gal. fuel burn if the original weight was 1,450 lb. and the MOM/1000 was 108 lb./in.? (See Figures 27 and 28.)

1—Out of limits FWD.
2—Out of limits AFT.
3—Within limits near the FWD limit.
4—Within limits near the AFT limit.

1247. What is the condition of the weight and balance o the gyroplane as loaded? (See Figures 27 and 28.)

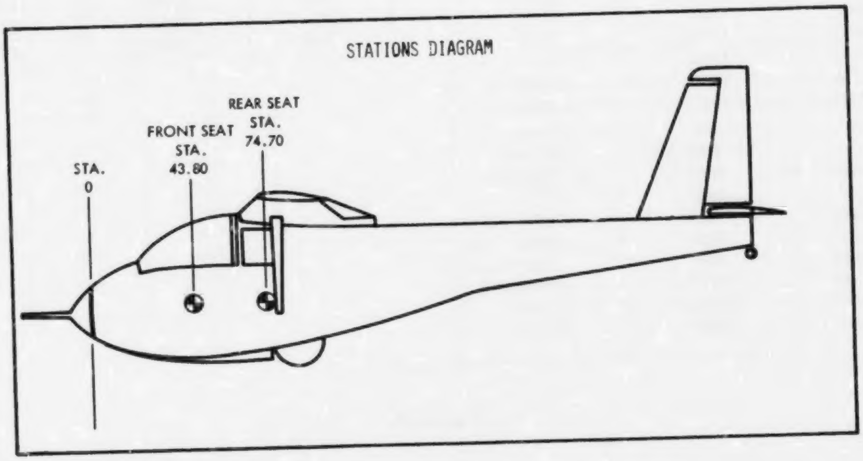
	WEIGHT (LB.)	**MOM/1000**
Empty weight	1,074	85.6
Oil, 6 qt.	---	1.0
Pilot and passenger	247	---
Fuel, 12 gal.	---	---
Baggage	95	---

1—Within limits.
2—Overweight.
3—Out of limits (AFT).
4—Out of limits (FWD).

1248. Approximately how much baggage, if any, may b carried in the gyroplane, without exceeding weight ar balance limits? (See Figures 27 and 28.)

	WEIGHT (LB.)	**MOM/1000**
Empty weight	1,074	85.6
Oil, 6 qt.	---	1.0
Fuel, Full	---	---
Pilot (FWD)	224	---

1—None, overweight.
2—71 lb.
3—100 lb.
4—171 lb.



Empty Weight - 610 lbs.
Empty Weight Sta. - 96.47"
Maximum Gross Weight - 1,040 lbs.
Center of Gravity Limits - Sta. 78.20 to Sta. 86.10

Figure 26

CENTER OF GRAVITY MOMENT ENVELOPE

NORMAL CATEGORY

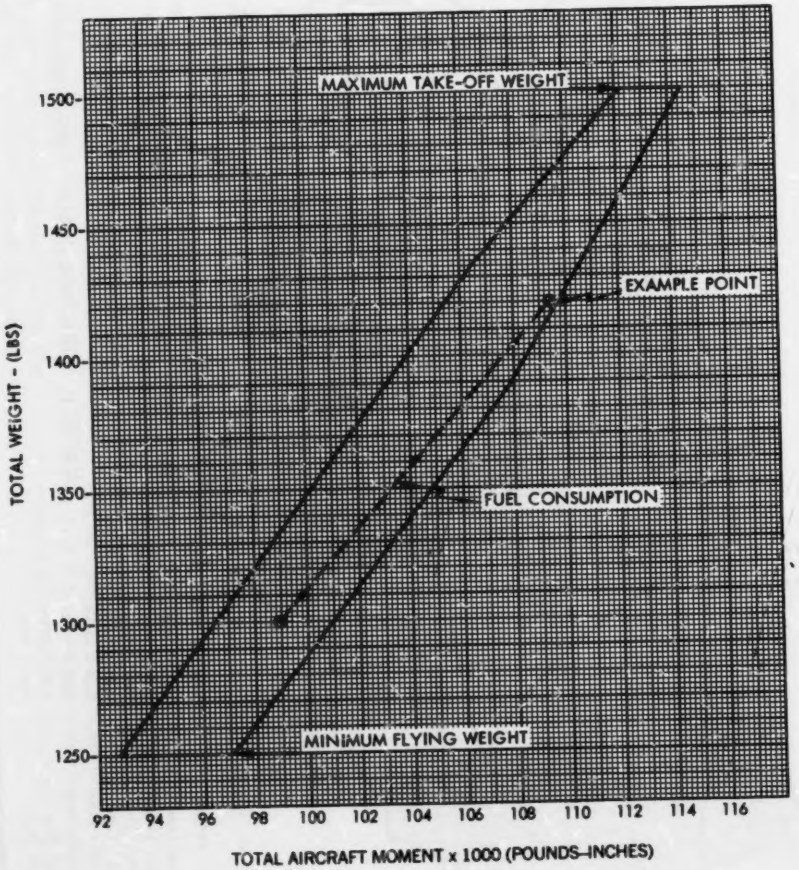


Figure 27

LOADING CHART

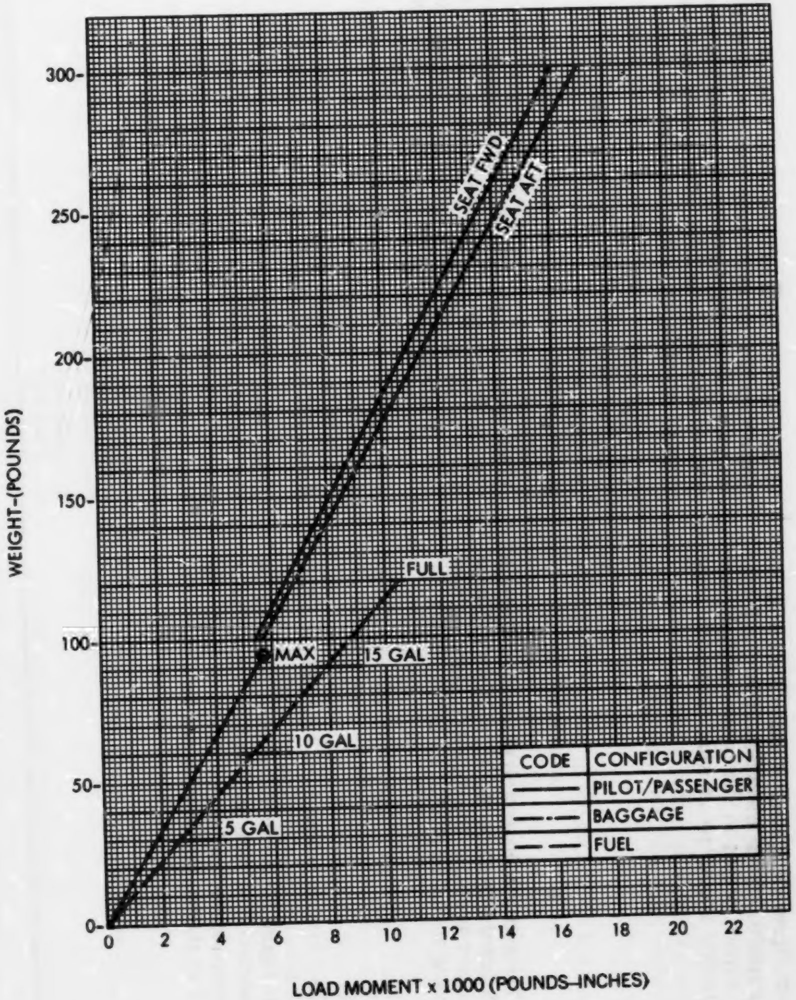


Figure 28

1249. Refer to Figure 29. An aircraft departs an airport in the eastern daylight time zone at 0945 EDT for a 2-hour flight to an airport located in the central daylight time zone. The landing should be at what Greenwich mean time?

1—1145Z.
2—1345Z.
3—1445Z.
4—1545Z.

1250. Refer to Figure 29. An aircraft departs an airport in the central standard time zone at 0930 CST for a 2-hour flight to an airport located in the mountain standard time zone. The landing should be at what time?

1—0930 MST.
2—1030 MST.
3—1130 MST.
4—1230 MST.

1251. Refer to Figure 29. An aircraft departs an airport in the central standard time zone at 0845 CST for a 2-hour flight to an airport located in the mountain time zone. The landing should be at what Greenwich mean time?

1—1345Z.
2—1445Z.
3—1545Z.
4—1645Z.

1252. Refer to Figure 29. An aircraft departs an airport in the mountain standard time zone at 1615 MST for a 2-hour 15-minute flight to an airport located in the Pacific standard time zone. What should be the estimated time of arrival at the destination airport?

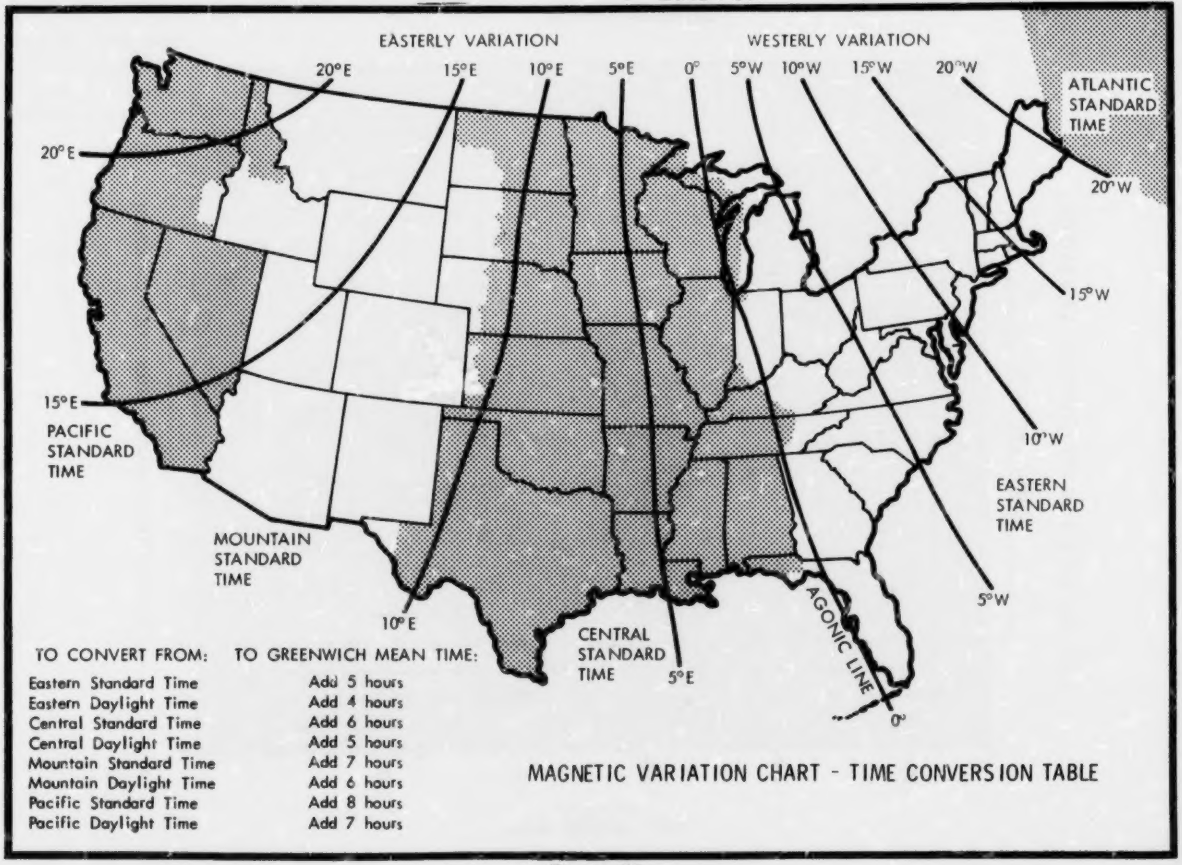
1—1630 PST.
2—1730 PST.
3—1830 PST.
4—1930 PST.

1253. Refer to Figure 29. An aircraft departs an airport in the Pacific standard time zone at 1030 PST for a 4-hour flight to an airport located in the central standard time zone. The landing should be at what Greenwich mean time?

1—2030Z.
2—2130Z.
3—2230Z.
4—2330Z.

1254. Refer to Figure 29. An aircraft departs an airport in the mountain standard time zone at 1515 MST for a 2-hour 30-minute flight to an airport located in the Pacific standard time zone. What is the estimated time of arrival at the destination airport?

1—1645 PST.
2—1745 PST.
3—1845 PST.
4—2345 PST.



TO CONVERT FROM:	TO GREENWICH MEAN TIME:
Eastern Standard Time	Add 5 hours
Eastern Daylight Time	Add 4 hours
Central Standard Time	Add 6 hours
Central Daylight Time	Add 5 hours
Mountain Standard Time	Add 7 hours
Mountain Daylight Time	Add 6 hours
Pacific Standard Time	Add 8 hours
Pacific Daylight Time	Add 7 hours

MAGNETIC VARIATION CHART - TIME CONVERSION TABLE

Figure 29

1255. How should the controls be held while taxiing a tricycle-gear equipped airplane into a left quartering headwind as depicted by A in Figure 30?

1—Left aileron up, neutral elevator.
2—Left aileron down, neutral elevator.
3—Left aileron up, down elevator.
4—Left aileron down, down elevator.

1256. How should the controls be held while taxiing a tricycle-gear equipped airplane into a left quartering tailwind as depicted by C in Figure 30?

1—Left aileron up, neutral elevator.
2—Left aileron down, neutral elevator.
3—Left aileron up, down elevator.
4—Left aileron down, down elevator.

1257. While taxiing a tricycle-gear equipped airplane into a right quartering headwind as depicted by B in Figure 30, the right aileron should be held

1—up and the elevator neutral.
2—down and the elevator neutral.
3—up and the elevator down.
4—down and the elevator down.

1258. While taxiing a tricycle-gear equipped airplane in a right quartering tailwind as depicted by D in Figure 30, the right aileron should be held

1—up and the elevator neutral.
2—down and the elevator neutral.
3—up and the elevator down.
4—down and the elevator down.

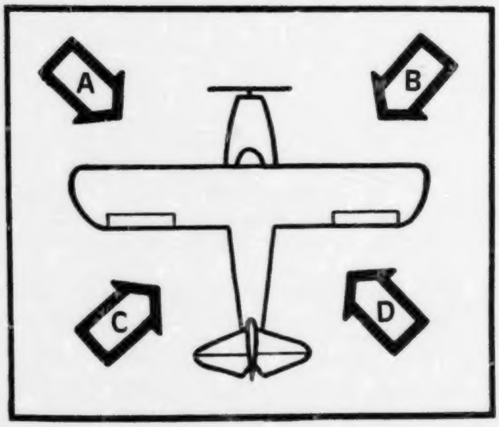


Figure 30

1259. When taxiing with strong quartering tailwinds, which of the following aileron positions should be used?

1—Aileron parallel to the ground on the side from which the wind is blowing.
2—Neutral (streamlined position).
3—Aileron up on the side from which the wind is blowing.
4—Aileron down on the side from which the wind is blowing.

1260. Which of the following aileron positions should a pilot generally use when taxiing in strong quartering headwinds?

1—Aileron up on the side from which the wind is blowing.
2—Aileron down on the side from which the wind is blowing.
3—Neutral.
4—Aileron parallel to the ground on the side from which the wind is blowing.

1261. Which wind condition would be most critical when taxiing a nosewheel-equipped high-wing airplane?

1—Direct headwind.
2—Direct crosswind.
3—Quartering headwind.
4—Quartering tailwind.

1262. If the pilot experiences ground resonance during rotor spin-up, what action should the pilot take?

1—Taxi to a smooth area.
2—Close the throttle and slowly raise the spin-up lever.
3—Make a normal takeoff immediately.
4—Make a jump takeoff immediately.

1263. What precaution should be taken while taxiing a gyroplane?

1—The cyclic stick should be held in the neutral position at all times.
2—Avoid abrupt control movements when blades are turning.
3—The cyclic stick should be held slightly aft of neutral at all times.
4—Taxi on rough terrain at a slightly higher speed when the rotor blades are turning.

1264. During surface taxiing, the collective pitch is used to control

1—drift during a crosswind.
2—rate of speed.
3—ground track.
4—heading.

1265. During surface taxiing, the cyclic pitch stick is used to control

1—forward movement.
2—heading.
3—ground track.
4—rate of speed.

1266. The first action after starting an aircraft engine should be to

1—adjust for proper RPM and check for desired indications on the engine gauges.
2—check the magneto or ignition switch momentarily in the OFF position for proper grounding.
3—test each brake and the parking brake.
4—visually clear the area for people and obstacles.

1267. What is the recommended procedure for a flight from Jamestown VOR/DME northbound on V170 through Devils Lake East MOA when the MOA is activated? (See Figure 31.)

1—Remain below 11,000 ft. MSL.
2—Contact Jamestown FSS for traffic advisories.
3—Fly at least 4 NM to the right or left of the centerline of the airway.
4—Contact Grand Forks Flight for flight–following service.

1268. What is the approximate latitude and longitude of Cooperstown Airport (B)? (See Figure 31.)

1—47°25′N – 98°06′W.
2—47°55′N – 98°06′W.
3—47°25′N – 99°54′W.
4—47°55′N – 99°54′W.

1269. The Common Traffic Advisory Frequency (CTAF FSS) at Jamestown Airport (D in Figure 31) is

1—121.1 MHz.
2—122.0 MHz.
3—123.0 MHz.
4—123.6 MHz.

1270. The airspace overlying and within 5 SM of Barnes County Airport (F in Figure 31) is

1—an airport traffic area from the surface to 3,000 ft. AGL.
2—a control zone from the surface to 14,500 ft. MSL.
3—uncontrolled airspace from the surface to 700 ft. AGL.
4—special use airspace from the surface to the overlying control area.

1271. Determine the magnetic course from McVille Airport (A) to Jamestown Airport (D). (See Figure 31.)

1—013°.
2—021°.
3—193°.
4—201°.

1272. What minimum altitude should be used for a "go–ahead point" at Eckelson (E) in order to arrive at Barnes County Airport (F) at 1,000 ft. AGL if the glide ratio is 22 : 1 in no wind conditions? Use the recommended safety factor. (See Figure 31.)

1—4,480 ft. MSL.
2—5,879 ft. MSL.
3—7,960 ft. MSL.
4—9,359 ft. MSL.

1273. A balloon drifts over the town of Eckelson (E) on a magnetic course of 282 at 10 MPH. If wind conditions remain constant, where will the balloon be after 2 hr. 30 min.? (See Figure 31.)

1—3 mi. south–southwest of Buchanan.
2—Over Buchanan.
3—Over the tower southwest of Fried.
4—2 mi. south of the Arrowwood National Wildlife Refuge.

1274. What is the recommended communication procedure when inbound to land at McVille Airport (A)? (See Figure 31.)

1—Broadcast intentions when 10 mi. out on 122.9 MHz.
2—Contact UNICOM when 10 mi. out on 122.8 MHz.
3—Circle the airport in a left turn prior to entering traffic.
4—Broadcast intentions when 10 mi. out on 121.5 MHz.

1275. What is the Common Traffic Advisory Frequency (CTAF) at Barnes County Airport (F)? (See Figure 31.)

1—121.5 MHz.
2—122.0 MHz.
3—122.8 MHz.
4—123.6 MHz.

1276. If a glider is launched over Barnes County Airport (F) with sufficient altitude to glide to Jamestown Airport (D), how long will it take for the flight at an average 40 MPH groundspeed? (See Figure 31.)

1—20 min.
2—27 min.
3—39 min.
4—46 min.

1277. Identify the airspace over Hoggarth Farm Airport (C that exists from the surface to 14,500 ft. (See Figure 31.)

1—Uncontrolled airspace – surface is 14,500 ft.
2—Uncontrolled airspace – surface to 700 ft. AGL, control area – 700 ft. AGL to 14,500 ft. MSL.
3—Uncontrolled airspace – surface to 1,200 ft. AGL control area – 1,200 ft. AGL to 14,500 ft. MSL.
4—Control area – surface to 14,500 ft. MSL.

1278. What is the recommended procedure for contactin Flight Watch in the area depicted by Figure 31 fo En Route Flight Advisory Service?

1—Contact the Jamestown Flight Watch on 123.6 MHz.
2—Contact the Grand Forks Flight Watch on 122.0 MHz.
3—Contact the Jamestown FSS on 123.0 MHz.
4—Contact the Grand Forks Flight Watch on 121.5 MHz.

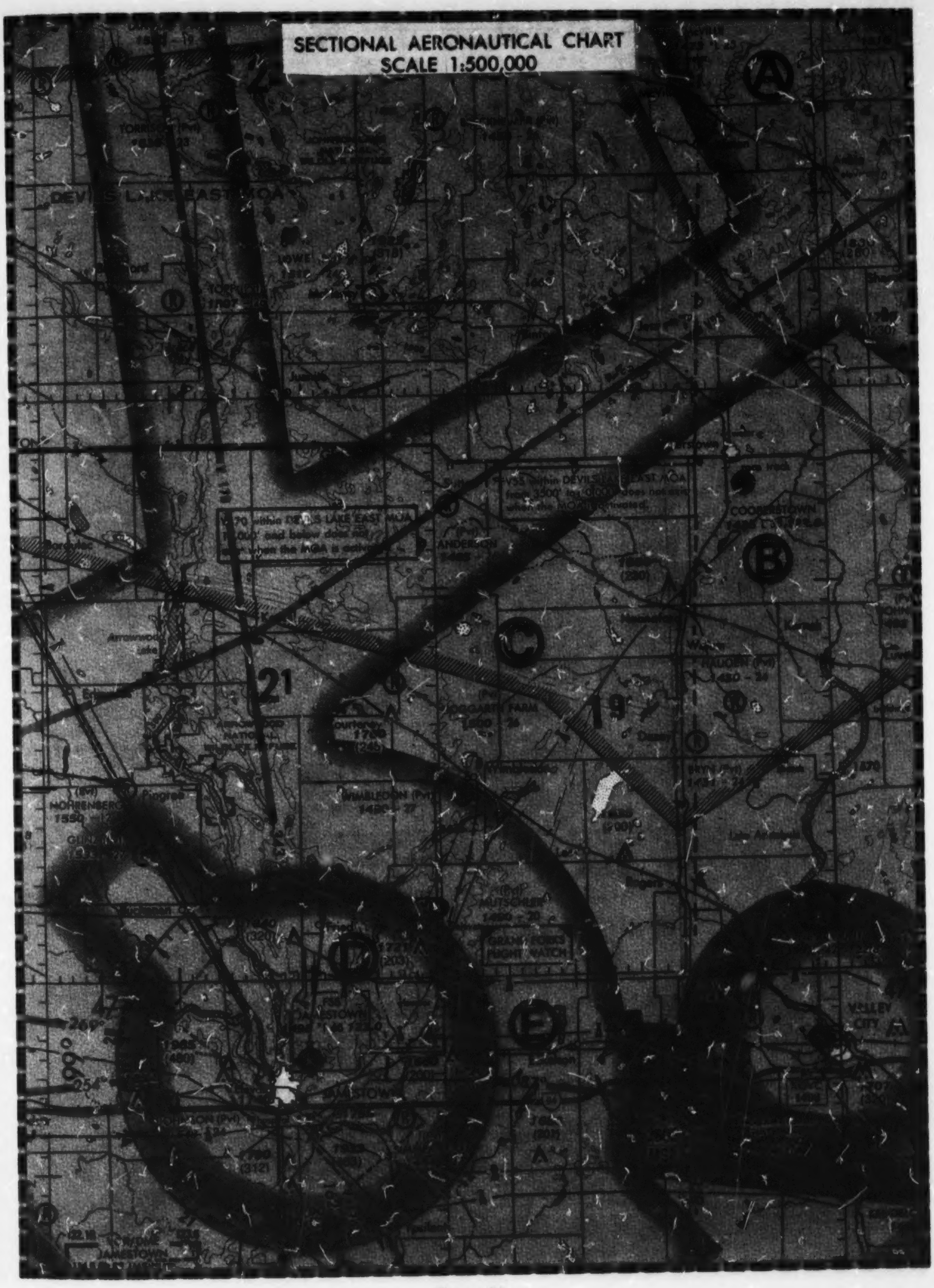

SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000
A
B
C
D
E
21
19
DEVILS LAKE EAST MOA
COOPERSTOWN
ANDERSON
WIMBLEDON (Pvt)
MUTSCHLER
GRAND FORKS NIGHT WATCH
JAMESTOWN
VALLEY CITY
Arrowwood Lake
Pingree

Figure 31

1279. What hazards to aircraft may exist in warning areas such as Warning W-50? (See Figure 32.)

1—Unusual, often invisible, hazards such as aerial gunnery or guided missiles.
2—High volume of pilot training or unusual type of aerial activity.
3—Approach and departure area for military aircraft to and from the North Atlantic Control Area.
4—Overwater military training routes.

1280. What minimum equipment is required to land and take off at Norfolk International? (See Figure 32, Area A.)

1—VHF transmitter and receiver.
2—Transponder and omnireceiver.
3—Transponder, omnireceiver, and DME.
4—Transponder, omnireceiver, DME, and VHF transmitter and receiver.

1281. The flag symbol at Lake Drummond (Area B) in Figure 32 represents

1—a compulsory reporting point for the Norfolk TRSA.
2—the recommended distance to contact Norfolk TRSA.
3—a visual checkpoint used to identify position for initial callup to Norfolk TRSA.
4—an outer limit where VFR traffic is not permitted to proceed further without radar contact with Norfolk TRSA.

1282. What is the recommended communications procedure for a landing at Currituck County Airport? (See Figure 32, Area C.)

1—Contact Elizabeth City CGAS/MUNI CT for traffic advisories.
2—Contact Elizabeth City FSS for airport advisory service.
3—Request Stage III radar service from Norfolk TRSA.
4—Transmit in the blind on 122.9 MHz when 10 mi. out and give position reports in the traffic pattern.

1283. Determine the approximate latitude and longitude of Currituck County Airport. (See Figure 32, Area C.)

1—36°24′N - 76°01′45″W.
2—36°24′N - 75°58′15″E.
3—36°48′N - 76°01′45″W.
4—36°48′N - 75°58′15″E.

1284. A balloon launched at the town of Edenton (Area D) drifts northeasterly along the railroad. What minimum MSL altitude must it maintain to clear all of the obstacles in the vicinity of Hertford by at least 500 ft.? (See Figure 32.)

1—805 ft.
2—1,000 ft.
3—1,015 ft.
4—1,030 ft.

1285. The word CAUTION (Area A or Area E) denotes what hazard to aircraft? (See Figure 32.)

1—Guy wires extending from radio or TV towers.
2—Tall bridge over the inlet to the body of water.
3—Powerlines crossing the body of water.
4—Area contains aerial activities hazardous to nonparticipating traffic.

1286. Over which area should a glider pilot expect to find the best lift under normal conditions? (See Figure 32.)

1— W
2— X
3— Y
4— Z

1287. Determine the magnetic course from First Flight Airport (Area E) to Hampton Roads Airport (Area B). (See Figure 32.)

1—312.
2—321.
3—330.
4—348.

1288. What is your approximate position on V1, southwest of Norfolk (Area A) if the VOR receiver indicates you are on the 340 radial of Elizabeth City VOR (Area C)? (See Figure 32.)

1—15 NM from Norfolk VORTAC.
2—18 NM from Norfolk VORTAC.
3—23 NM from Norfolk VORTAC.
4—28 NM from Norfolk VORTAC.

1289. The elevation of the Chesapeake Municipal Airport (Area B) in Figure 32 is

1—sea level.
2—20 ft.
3—36 ft.
4—360 ft.

1290. En route to First Flight Airport (Area E), your flight passes over Hampton Roads Airport (Area B) at 1456 and then over Chesapeake Municipal at 1501. At what time should your flight arrive at First Flight? (See Figure 32.)

1—1516.
2—1521.
3—1526.
4—1531.

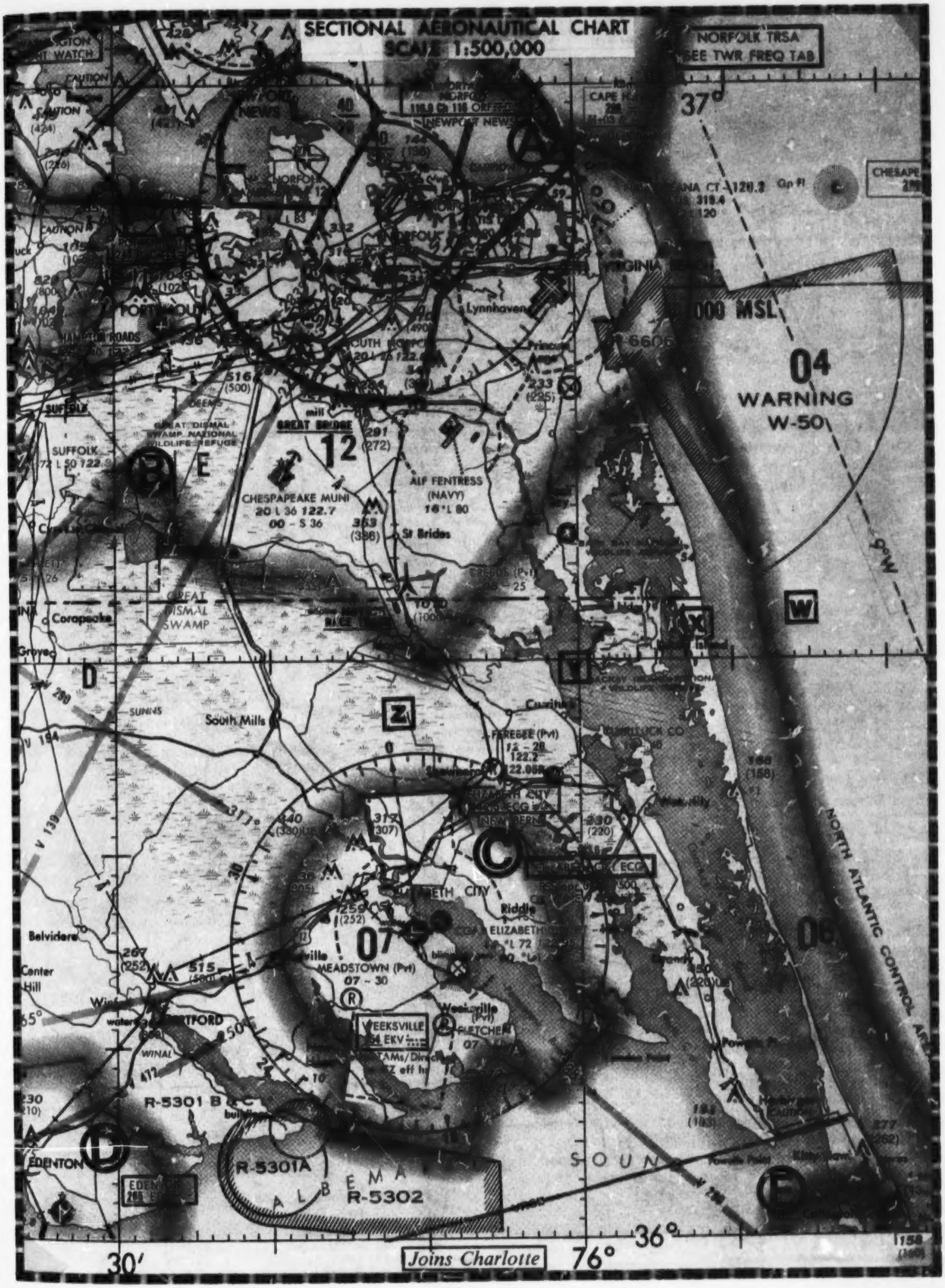

SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000
NORFOLK TRSA
SEE TWR FREQ TAB
37°
NEWPORT NEWS
NORFOLK
PORTSMOUTH
HAMPTON ROADS
VIRGINIA BEACH
Lynnhaven
A
B
C
D
E
F
W
X
Y
Z
04
WARNING
W-50
12
07
06
GREAT BRIDGE
GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE
SUFFOLK
CHESPAPEAKE MUNI
20 L 36 122.7
00 - S 36
ALF FENTRESS
(NAVY)
16 L 80
St Brides
GREAT DISMAL SWAMP
Corapeake
South Mills
FERESEE (Pvt)
ELIZABETH CITY
ECG
MEADSTOWN (Pvt)
07 - 30
WEEKSVILLE
Riddle
Belvidere
Center Hill
HERTFORD
WINAL
R-5301 B & C
R-5301A
R-5302
EDENTON
ALBEMARLE SOUND
NORTH ATLANTIC CONTROL AREA
9°W
36°
76°
30′
Joins Charlotte

Figure 32

1291. Determine the magnetic heading for a flight from Hazen Airport (Area C) to Minot International (Area A). The wind is from 330 at 25 kts. and the TAS is 100 kts. (See Figure 33.)

1—351°.
2—002°.
3—012°.
4—021°.

1292. What is the estimated time en route from Hazen Airport (Area C) to Minot International (Area A)? The wind is from 330 at 25 kts. and the TAS is 100 kts. Add 3-1/2 min. for departure and climbout. (See Figure 33.)

1—44 min.
2—48 min.
3—52 min.
4—56 min.

1293. What course should be selected on the OMNI bearing selector to make a direct flight from Hazen Airport (Area C) to the Minot VORTAC with a TO indication? (See Figure 33.)

1—001°.
2—012°.
3—181°.
4—192°.

1294. On what frequency can a pilot receive a Transcribed Weather Broadcast in the area depicted by Figure 33?

1—117.1 MHz.
2—118.0 MHz.
3—122.0 MHz.
4—122.95 MHz.

1295. On what frequency can a pilot receive En Route Flight Advisory Service in the area depicted by Figure 33?

1—117.1 MHz.
2—118.0 MHz.
3—122.0 MHz.
4—122.95 MHz.

1296. What type military flight operations should a pilot expect on IR 644? (See Figure 33.)

1—Area navigation training flights in IFR weather.
2—Instrument rotorcraft training flights below 1,200 ft. AGL.
3—Instrument training flights below 1,500 ft. AGL at speeds in excess of 150 kts.
4—Training flights above 1,500 ft. AGL regardless of the weather and at speeds in excess of 250 kts.

1297. A balloon launched at Flying S Airport (Area A) drifts southward towards the lighted obstacle. If the altimeter was set at 0 ft. upon launch, what should it indicate if the balloon is to clear the obstacle at 500 ft. above the top? (See Figure 33.)

1—1,531 ft.
2—1,309 ft.
3—2,340 ft.
4—3,649 ft.

1298. An airship crosses over Minot VORTAC (Area A) at 1056 and over the creek 8 NM south-southeast on V15 at 1108. What should be the approximate position on V15 at 1211? (See Figure 33.)

1—Over Lake Nettie National Wildlife Refuge.
2—Over the river north of Turtle Lake.
3—Crossing the road east of Underwood.
4—Over the powerlines east of Washburn Airport.

1299. The terrain elevation of the light tan colored area between Minot (Area A) and Audubon Lake (Area B in Figure 33) varies from

1—sea level to 2,000 ft. MSL.
2—2,000 ft. to 2,250 ft. MSL.
3—2,000 ft. to 2,700 ft. MSL.
4—2,600 ft. to 2,700 ft. MSL.

1300. Which public use airports depicted in Figure 33 are indicated as having fuel and are attended during normal working hours?

1—Minot and Flying S.
2—Minot and Garrison Municipal.
3—Minot, Flying S, and Garrison Municipal.
4—Minot, Flying S, Garrison Municipal, Hazen, and Washburn.

1301. The CTAF frequency for Garrison Municipal (Area B in Figure 33) is

1—122.0 MHz.
2—122.8 MHz.
3—122.9 MHz.
4—123.6.MHz.

1302. Which airport is located at approximately 47°45′ N longitude and 100°57′30″ W latitude? (See Figure 33.)

1—Linrud.
2—Willoughby.
3—Johnson.
4—Washburn.

1303. Of what practical use, if any, are the privat airports if a pilot does not have the owner's permission t use them? (See Figure 33.)

1—Of no practical use.
2—Touch-and-go landing by permission from th nearest FSS.
3—Pickup or discharge of passengers if intentions ar broadcast in the blind on 122.9 MHz.
4—Landmark value for navigation and emergency use.

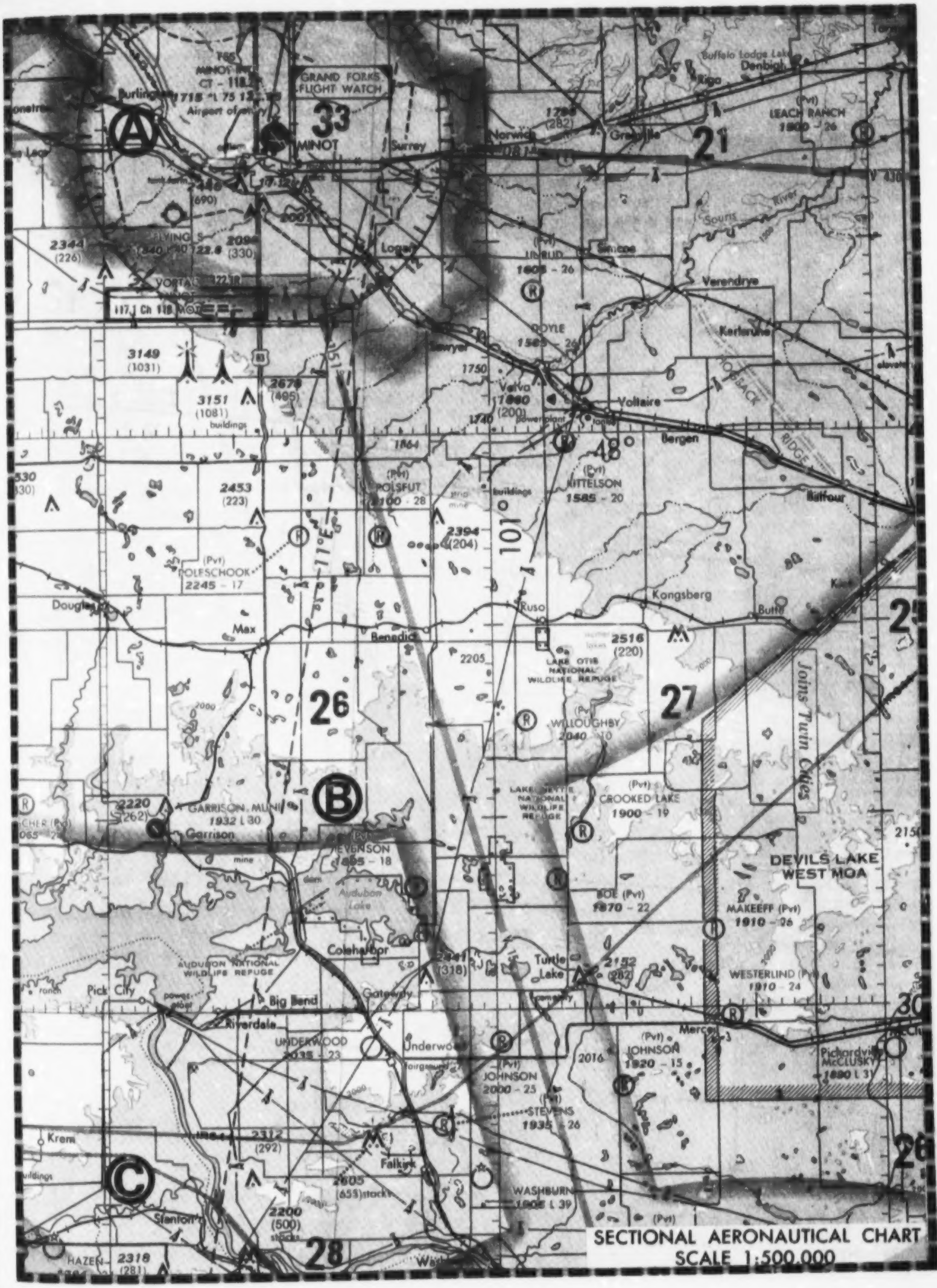

A
B
C
MINOT
GRAND FORKS FLIGHT WATCH
Garrison
GARRISON MUNI
1932 L 30
Max
Benedict
Ruso
Kongsberg
Velva
Voltaire
Bergen
Balfour
Norwich
Granville
Logan
Surrey
Sawyer
Verendrye
Karlsruhe
Douglas
Coleharbor
Underwood
Riverdale
Pick City
Big Bend
Turtle Lake
Mercer
Falkirk
Washburn
Stanton
Hazen
LAKE OTIS NATIONAL WILDLIFE REFUGE
AUDUBON NATIONAL WILDLIFE REFUGE
DEVILS LAKE WEST MOA
Joins Twin Cities
SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000

Figure 33

1304. The vertical limits of that portion of the airway over Magee Airport (Figure 34) are

1—700 ft. AGL to 7,500 ft. MSL.
2—1,200 ft. AGL to 7,500 ft. MSL.
3—7,500 ft. MSL to 12,500 ft. MSL.
4—7,500 ft. MSL to 18,000 ft. MSL.

1305. For information about the parachute jumping and glider operations at Henley Airport (Area B, Figure 34), refer to

1—notes on the border of the chart.
2—the Airport/Facility Directory.
3—the NOTAMS Directory.
4—AIM (Airman's Information Manual).

1306. What minimum altitude is necessary to arrive at County City Airport at 1,000 ft. from a "go-ahead point" at Cocolalla with a 24 : 1 glide ratio in still air? Use the recommended safety factor. (See Figure 34, Area A.)

1—3,860 ft. MSL.
2—4,360 ft. MSL.
3—7,846 ft. MSL.
4—8,846 ft. MSL.

1307. A balloon, launched at CX Airport located near the east end of Pend Oreille Lake (Figure 34), drifts south-southwest. What is the approximate elevation of the highest terrain for 20 mi. along its path?

1—2,000 - 4,000 ft. MSL.
2—4,000 - 6,000 ft. MSL.
3—6,000 - 7,000 ft. MSL.
4—7,000 - 8,000 ft. MSL.

1308. If a balloon is launched at Secret Spirit Lake Airport (Area B, Figure 34) with a reported wind from 220 at 5 kts., what should be its approximate position after 2 hr. of flight?

1—Near Careywood.
2—Crossing the railroad southwest of Granite Airport.
3—3-1/2 mi. southwest of Rathdrum.
4—2 mi. northeast of Rathdrum.

1309. If Coeur D'Alene Tower is not in operation, which frequency should be used to obtain wind direction and runway-in-use information? (See Figure 34, Area B.)

1—122.1/108.8 MHz, FSS.
2—119.1 MHz, CTAF.
3—122.8 MHz, UNICOM.
4—122.9 MHz, MULTICOM.

1310. If Coeur D'Alene Tower is not in operation, which frequency should be used to monitor airport traffic? (See Figure 34, Area B.)

1—122.1/108.8 MHz, FSS.
2—119.1 MHz, CTAF.
3—122.8 MHz, UNICOM.
4—122.9 MHz, MULTICOM.

1311. Determine the magnetic heading for a flight from County City Airport (Area A) to St. Maries Airport (Area D). The wind is from 215 at 25 kts. and the TAS is 125 kts. (See Figure 34.)

1—161°.
2—167°.
3—181°.
4—187°.

1312. What is the estimated time en route from County City Airport (Area A) to St. Maries Airport (Area D)? The wind is from 215 at 25 kts. and the TAS is 125 kts. (See Figure 34.)

1—24 min.
2—27 min.
3—30 min.
4—34 min.

1313. What is the magnetic heading for a flight from Priest River Airport (Area A) to Shoshone County Airport (Area C)? The wind is from 030 at 12 kts. and the TAS is 95 kts. (See Figure 34.)

1—116°.
2—123°.
3—130°.
4—136°.

1314. Determine the time en route for a flight from Priest River Airport (Area A) to Shoshone County Airport (Area C). The wind is from 030 at 12 kts. and the TAS is 95 kts. Add 2 min. for climbout. (See Figure 34.)

1—23 min.
2—27 min.
3—31 min.
4—35 min.

1315. Determine the magnetic heading for a flight from St. Maries Airport (Area D) to Priest River Airport (Area A). The wind is from 300 at 14 kts. and the TAS is 90 kts. (See Figure 34.)

1—319.
2—325.
3—331.
4—339.

1316. What is the time en route for a flight from St. Maries Airport (Area D) to Priest River Airport (Area A)? The wind is from 300 at 14 kts. and the TAS is 90 kts. Add 3 min. for climbout. (See Figure 34.)

1—38 min.
2—43 min.
3—48 min.
4—51 min.

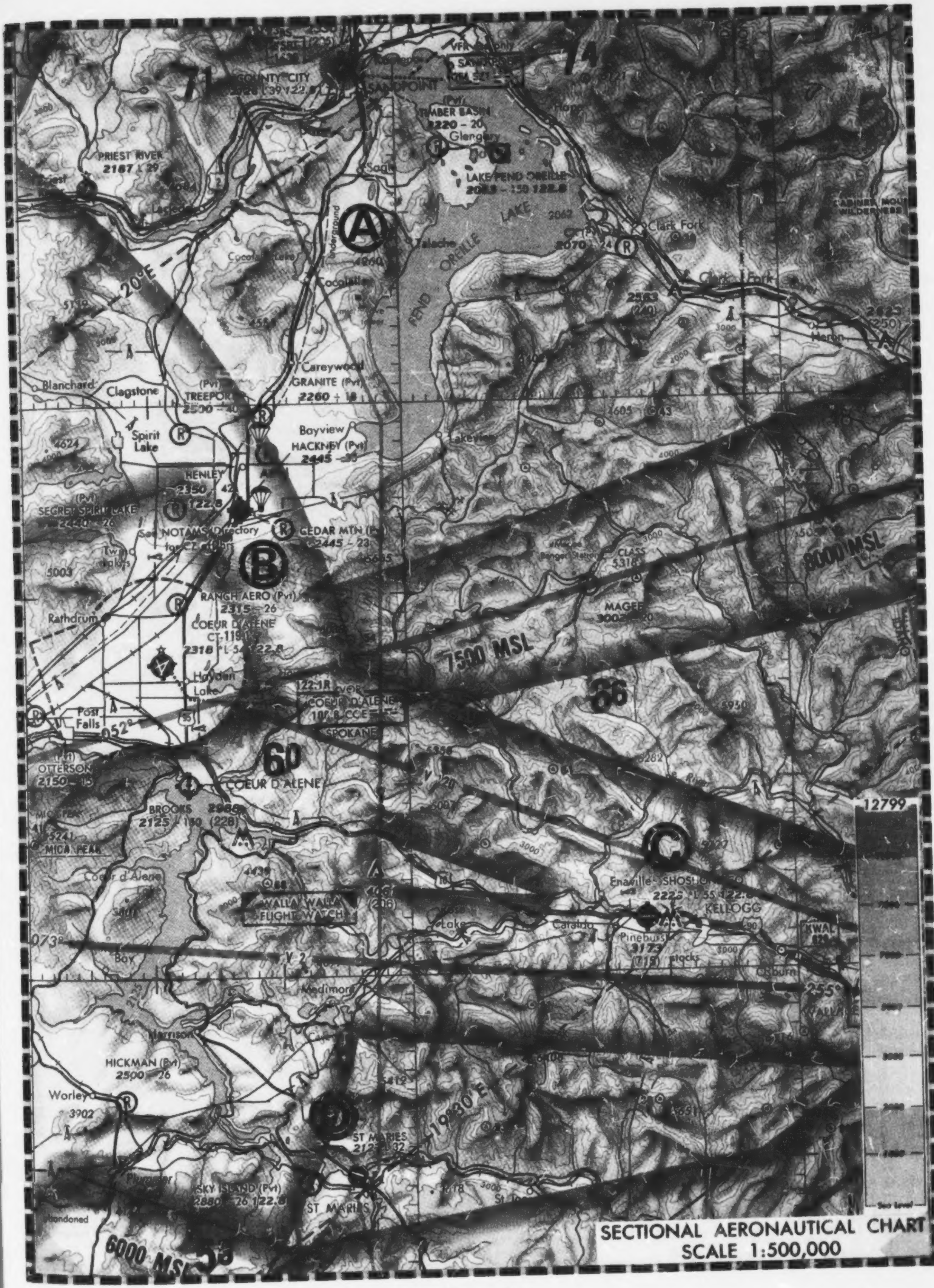

A
B
C
D
SANDPOINT
COUNTY CITY
PRIEST RIVER
2187 - 29
TIMBER BASIN
LAKE PEND OREILLE
PEND OREILLE LAKE
Clark Fork
Careywood
GRANITE (Pvt)
2260 - 18
Blanchard
Clagstone
TREEPORT
Spirit Lake
Bayview
HACKNEY (Pvt)
2445 - 30
HENLEY
SECRET SPIRIT LAKE
CEDAR MTN
See NOTAMS/Directory for CZ effective
RANCH AERO (Pvt)
2315 - 26
Rathdrum
COEUR D'ALENE
CT-119.15
2318 L 54 122.8
Hayden Lake
Post Falls
COEUR D'ALENE
108.8 COE
SPOKANE
OTTERSON
2150 - 15
COEUR D'ALENE
BROOKS
2125 - 150
MICA PEAK
WALLA WALLA
FLIGHT WATCH
CLASS
MAGEE
Enaville
SHOSHONE CO
KELLOGG
Cataldo
Pinehurst
Osburn
WALLACE
Medimont
Harrison
HICKMAN (Pvt)
2500 - 26
Worley
ST MARIES
SKY ISLAND (Pvt)
2880 - 26 122.8
20°E
19°30'E
052°
073°
255°
V 2
7500 MSL
8000 MSL
6000 MSL
71
74
60
66
55
12799
SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000

Figure 34

1317. The flag symbols at Statesboro Airport, Claxton–Evans County Airport, and Ridgeland Airport in Figure 35 are

1—boundaries of the Savannah TRSA.
2—airports with special traffic pattens.
3—airports with remote communications outlets for Savannah TRSA.
4—visual checkpoints to identify position for initial callup to the TRSA.

1318. What is the upper limit of the Savannah TRSA? (See Figure 35.)

1—Up to but not including 3,000 ft. AGL.
2—The base of the Continental Control Area.
3—10,000 ft. MSL.
4—18,000 ft. MSL.

1319. What is the height of the lighted obstacle approximately 8 mi. southwest of Savannah International? (See Figure 35, Area C.)

1—1,500 ft. AGL.
2—1,532 ft. AGL.
3—1,531 ft. AGL.
4—1,549 ft. AGL.

1320. Determine the compass heading for a flight from Allendale County Airport (Area A) to Claxton–Evans County Airport (Area B). The wind is from 090 at 16 kts. and the TAS is 90 kts. (See Figure 35.)

1—200°.
2—205°.
3—211°.
4—229°.

1321. What is the estimated time en route for a flight from Allendale County Airport (Area A) to Claxton–Evans County Airport (Area B)? The wind is from 090 at 16 kts. and the TAS is 90 kts. Add 2 min. for climbout. (See Figure 35.)

1—33 min.
2—37 min.
3—41 min.
4—45 min.

1322. Determine the compass heading for a flight from Claxton–Evans County Airport (Area B) to Hampton Varnville Airport (Area A). The wind is from 290 at 18 kts. and the TAS is 85 kts. (See Figure 35.)

1—034.
2—038.
3—042.
4—057.

1323. What is the estimated time en route for a flight from Claxton–Evans County Airport (Area B) to Hampton Varnville Airport (Area A)? The wind is from 290 at 18 kts. and the TAS is 85 kts. Add 2 min. for climbout. (See Figure 35.)

1—36 min.
2—39 min.
3—43 min.
4—46 min.

1324. While en route on V185, a flight crosses the 248 radial of Allendale VOR at 0951 and then crosses the 216 radial of Allendale VOR at 1000. What is the estimated time of arrival at Savannah VORTAC? (See Figure 35.)

1—1023.
2—1028.
3—1032.
4—1036.

1325. What is the approximate position of the aircraft if the VOR receivers indicate the 310 radial of Savannah VORTAC and the 190 radial of Allendale VOR? (See Figure 35.)

1—Town of Guyton.
2—Town of Springfield.
3—3 mi. east of Marlow.
4—Over the railroad 2 mi. southwest of Rincon.

1326. At what minimum altitude could an aircraft clear the cranes just east of Savannah International by 500 ft.? (See Figure 35, Area C.)

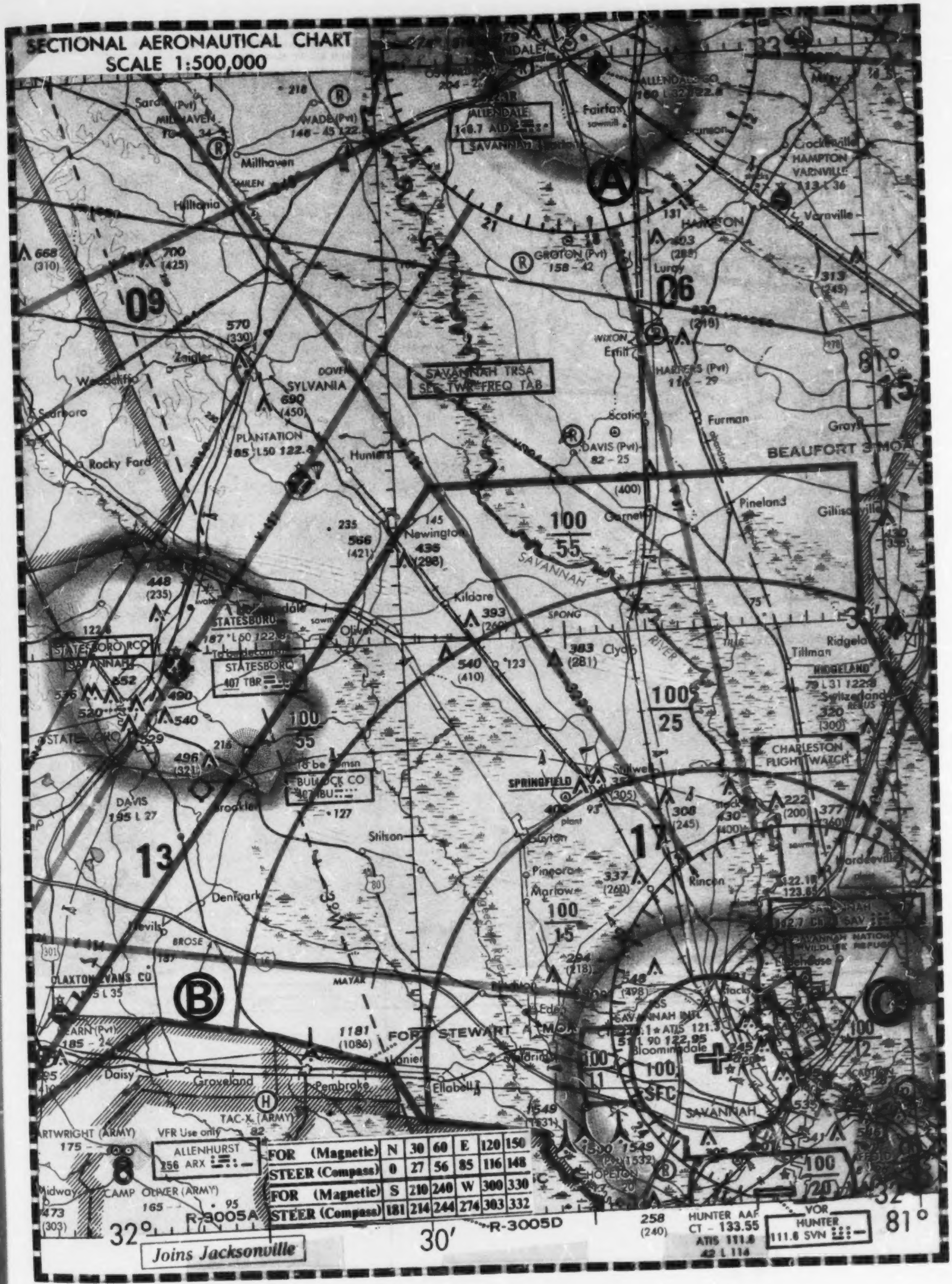
1—251 ft. MSL.
2—296 ft. MSL.
3—745 ft. MSL.
4—2,200 ft. MSL.

1327. How tall is the lighted stack approximately 14 mi. from the Savannah VORTAC on the 350 radial? (See Figure 35, Area C.)

1—305 ft. AGL.
2—400 ft. AGL.
3—430 ft. AGL.
4—830 ft. AGL.

1328. On what bearing should the VOR receiver (OBS) be set to navigate direct from Hampton Varnville Airpor (Area A) to Savannah VORTAC (Area C)? (See Figure 35.)

1—005°.
2—185°.
3—200°.
4—360°.



FOR (Magnetic)	N	30	60	E	120	150
STEER (Compass)	0	27	56	85	116	148
FOR (Magnetic)	S	210	240	W	300	330
STEER (Compass)	181	214	244	274	303	332

Figure 35

1329. What is the approximate position of the aircraft if the VOR receivers indicate the 250 radial of Sulphur Springs VORTAC and the 130 radial of Blue Ridge VORTAC? (See Figure 36.)

1—Caddo Mills Airport.
2—Meadowview Airport.
3—3 mi. southeast of Caddo Mills Airport.
4—3 mi. northeast of Caddo Mills Airport.

1330. On what bearing should the VOR receiver (OBS) be set in order to navigate direct from Majors Airport to Quitman VORTAC? (See Figure 36, Area A to B.)

1—101°.
2—108°.
3—281°.
4—288°.

1331. A cross-country flight on V114 passes over Quitman VORTAC at 0847 and then over the powerline at 0850 and 30 sec. At what time will the flight pass over the Blue Ridge VORTAC? (See Figure 36.)

1—0910.
2—0915.
3—0920.
4—0926.

1332. What minimum altitude is necessary to arrive at Caddo Mills Airport at 1,000 ft. from a "go-ahead point" at the town of Quinlan with a 30 : 1 glide ratio in still air? Use the recommended safety factor. (See Figure 36, Area A.)

1—3,477 ft. MSL.
2—4,265 ft. MSL.
3—5,265 ft. MSL.
4—5,822 ft. MSL.

1333. A glider is launched over Caddo Mills Airport with sufficient altitude to glide to Airpark East Airport. How long will it take for the flight at an average of 35 MPH? (See Figure 36, Area A.)

1—27 min.
2—29 min.
3—31 min.
4—33 min.

1334. Determine the magnetic course from Airpark East Airport to Winnsboro Airport. (See Figure 36, Area A to B.)

1—075°.
2—082°.
3—091°.
4—256°.

1335. What minimum altitude is necessary to vertically clear the obstacle on the northeast side of Airpark East Airport by 500 ft.? (See Figure 36, Area A.)

1—1,010 ft. MSL.
2—1,273 ft. MSL.
3—1,283 ft. MSL.
4—1,783 ft. MSL.

1336. What minimum altitude is necessary to vertically clear the obstacle on the southeast side of Winnsboro Airport by 500 ft.? (See Figure 36, Area B.)

1—821 ft. MSL.
2—1,013 ft. MSL.
3—1,401 ft. MSL.
4—1,513 ft. MSL.

1337. Determine the magnetic heading for a flight from Majors Airport to Winnsboro Airport. The wind is from 340 at 12 kts. and the true airspeed is 36 kts. (See Figure 36, Area A to B.)

1—078°.
2—091°.
3—101°.
4—114°.

1338. Estimate the time en route from Majors Airport to Winnsboro Airport. The wind is from 340 at 12 kts. and the true airspeed is 36 kts. (See Figure 36, Area A to B.)

1—55 min.
2—59 min.
3—63 min.
4—67 min.

1339. An airship passes over the Quitman VORTAC at 0940 and then over the intersection of the powerline and V114 at 0948. Approximately what time should the flight arrive over the Blue Ridge VORTAC? (See Figure 36.)

1—1100.
2—1104.
3—1109.
4—1117.

1340. Which cruising altitude is appropriate for a flight from Paris VORTAC to Quitman VORTAC? (See Figure 36.)

1—4,000 ft. MSL.
2—4,500 ft. MSL.
3—5,500 ft. MSL.
4—6,500 ft. MSL.

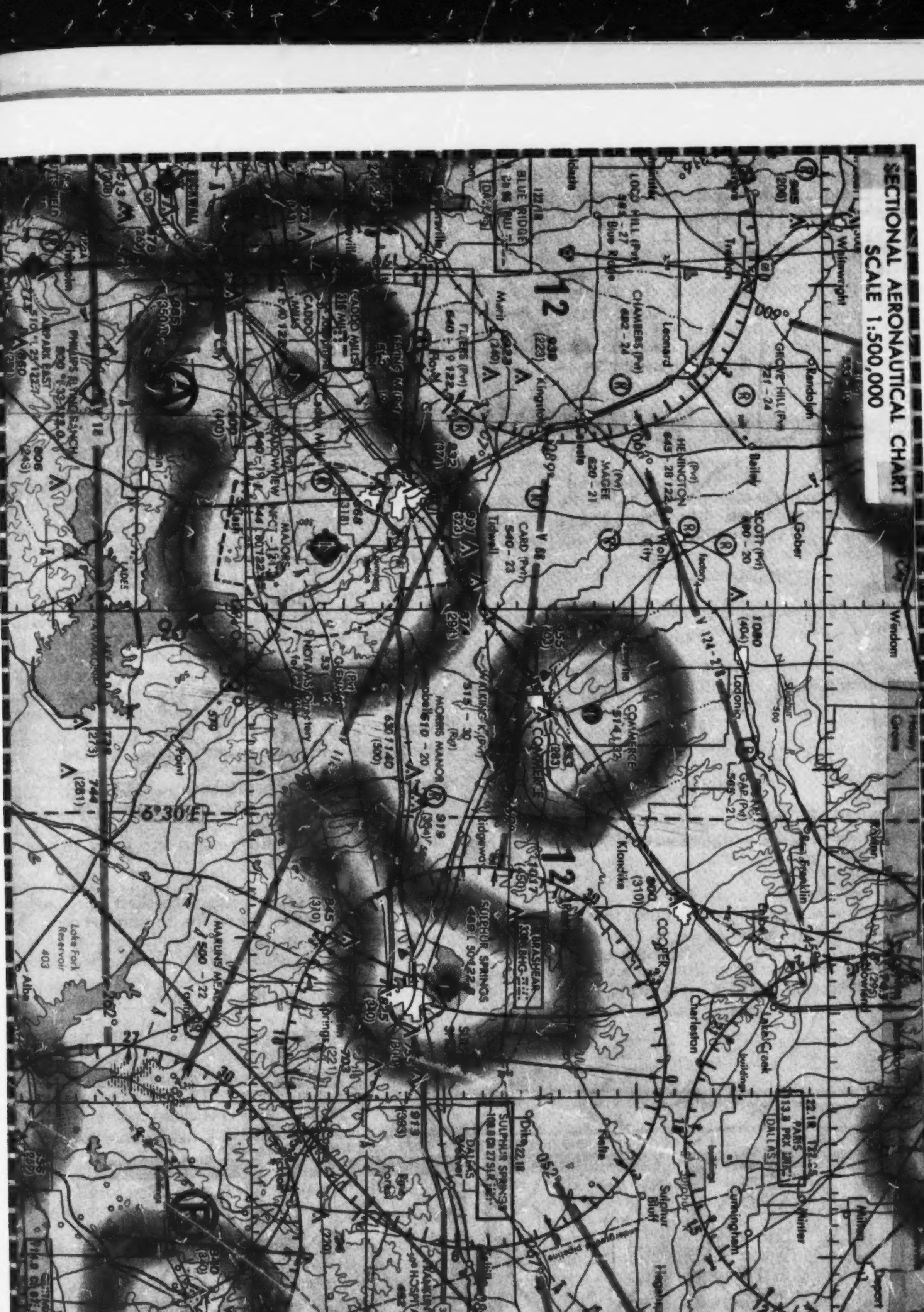

SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000
COMMERCE
SULPHUR SPRINGS
COOPER
PARIS
DALLAS
BLUE RIDGE
HENNINGTON
CADDO MILLS
MARTINS MEADOW
Lake Fork Reservoir
6°30'E
V 124
V 66
Greenville
Winnsboro

Figure 36

1341. Determine the magnetic bearing TO the station as indicated by ADF A in Figure 37.

1—030°.
2—150°.
3—210°.
4—330°.

1342. What magnetic heading should the pilot use to fly to the station as indicated by ADF B in Figure 37?

1—010°.
2—134°.
3—190°.
4—316°.

1343. Determine the approximate heading to intercept the 180° bearing TO the station using the information depicted by ADF B in Figure 37.

1—040°.
2—160°.
3—220°.
4—340°.

1344. What is the magnetic bearing FROM the station as indicated by ADF C in Figure 37?

1—090°.
2—115°.
3—270°.
4—295°.

1345. Which ADF indication in Figure 37 represents the aircraft tracking to the station with a right crosswind?

1—A.
2—B.
3—C.
4—D.

1346. What outbound bearing is being crossed by the aircraft represented by ADF A in Figure 37?

1—030°.
2—150°.
3—210°.
4—330°.

1347. If the RPM is low and the manifold pressure is high, what initial corrective action should be taken?

1—Increase the throttle.
2—Lower the collective pitch.
3—Raise the collective pitch.
4—Decrease the throttle.

1348. Is it necessary to preflight an aircraft that was hangared the night before in ready-to-fly condition?

1—No, if the aircraft has not been handled since hangaring.
2—Yes, because fuel contamination from condensation is possible.
3—Yes, because the oil level should always be checked.
4—No, if the same person who hangared the aircraft will act as pilot in command.

1349. Prior to every flight, a pilot should at least

1—check the operation of the ELT.
2—drain fuel from each quick drain.
3—perform a walk-around inspection of the aircraft.
4—check the required documents aboard the aircraft.

1350. What special check should be made on an aircraft during preflight after it has been stored an extended period of time?

1—ELT batteries and operation.
2—Condensation in the fuel tanks.
3—Damage or obstructions caused by animals, birds, or insects.
4—Lubrication of control systems and proper inflation of landing gear struts.

1351. The use of a written checklist for preflight inspection and starting the engine is recommended

1—as an excellent crutch for those pilots with a faulty memory.
2—for memorizing the procedures in an orderly sequence.
3—as a procedure to instill confidence in the passengers.
4—to ensure that all necessary items are checked in a logical sequence.

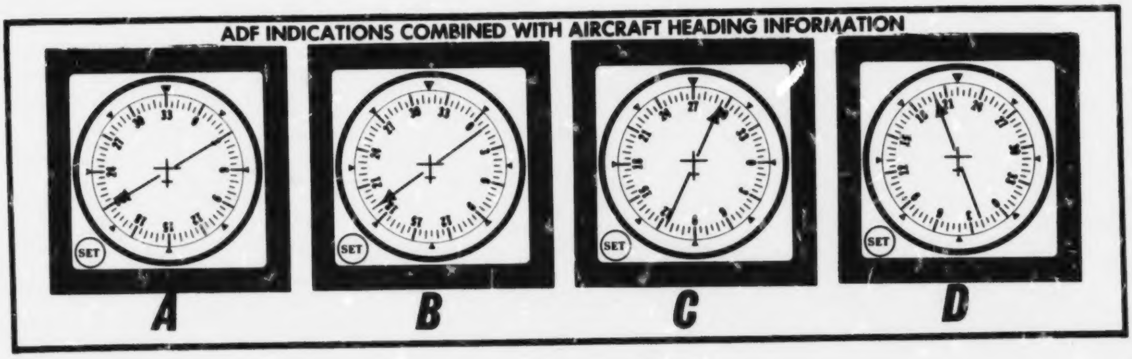

ADF INDICATIONS COMBINED WITH AIRCRAFT HEADING INFORMATION

Figure 37

1352. How should the fuel system be checked for leaks prior to flight?

1—Listen and smell.
2—Check all connections with a lighted match.
3—Cover all connections and tubing with soapy water.
4—Check pressure gauge reading before and after preflight.

1353. All fuel tanks should be fired during preflight to determine

1—the burner pressure and condition of the valves.
2—that the pilot light functions properly on each tank.
3—if there are any leaks in the tank.
4—that the burner is operating efficiently.

1354. In addition to the required documents, what carry-on equipment should be accounted for during preflight?

1—Survival kit.
2—Flotation gear.
3—Emergency locator transmitter.
4—Two means of burner ignition.

1355. Which weather reports and forecasts are most important for balloon operations?

1—Area Forecast, PIREPS, and Radar Summary.
2—Area Forecast, Winds Aloft Forecast, and Radar Summary.
3—Terminal Forecast, Winds Aloft Forecast, and Surface Analysis.
4—Terminal Forecast, Winds Aloft Forecast, and Surface Aviation Weather Reports.

1356. How is engine operation controlled on an engine equipped with a constant-speed propeller?

1—The throttle controls power output as registered on the manifold pressure gauge and the propeller control regulates engine RPM.
2—The throttle controls power output as registered on the manifold pressure gauge and the propeller control regulates a constant blade angle.
3—The throttle controls engine RPM as registered on the tachometer and the mixture control regulates the power output.
4—The throttle controls engine RPM as registered on the tachometer and the propeller control regulates the power output.

1357. A precaution for the operation of an engine equipped with a constant-speed propeller is to

1—avoid high RPM settings with high manifold pressure.
2—avoid high RPM settings with low manifold pressure.
3—always use a rich mixture with high RPM settings.
4—avoid high manifold pressure settings with low RPM.

1358. What is an advantage of a constant-speed propeller?

1—Permits the pilot to select and maintain a desired cruising speed.
2—Allows a higher cruising speed than possible with a fixed-pitch propeller.
3—Provides a smoother operation with stable RPM and eliminates vibrations.
4—Permits the pilot to select the blade angle for the most efficient performance.

1359. What action should be taken if the balloon shifts direction abruptly while in the vicinity of a thunderstorm?

1—Land immediately.
2—Descend to and maintain the lowest altitude possible.
3—Ascend to an altitude which will ensure adequate obstacle clearance in all directions.
4—Ascend in stairsteps to find a wind that will carry the balloon away from any thunderstorms.

1360. If severe turbulence is encountered, the airplane's airspeed should be reduced to

1—maneuvering speed.
2—the minimum steady flight speed in the landing configuration.
3—normal operation speed.
4—maximum structural cruising speed.

1361. Which flight technique is recommended for use during hot weather?

1—Use minimum allowable RPM and maximum allowable manifold pressure during all phases of flight.
2—During hovering flight, maintain minimum engine RPM during left pedal turns, and maximum engine RPM during right pedal turns.
3—During takeoff, accelerate quickly into forward flight.
4—During takeoff, accelerate slowly into forward flight.

1362. With calm wind conditions, which of these flight operations would require the most power?

1—A running takeoff.
2—A right-hovering turn.
3—A left-hovering turn.
4—Hovering in ground effect.

1363. If the pilot were to make a near-vertical power approach into a confined area with the airspeed near zero, what hazardous condition may develop?

1—Ground resonance when ground contact is made.
2—A settling-with-power condition.
3—Blade stall vibration could develop.
4—Coning could develop due to high blade loading.

1364. If anti–torque failure occurred during the landing touchdown, what could be done to help straighten out a left yaw prior to touchdown?

1—A flare to zero airspeed and a vertical descent to touchdown should be made.
2—Apply available throttle to help swing the nose to the right just prior to touchdown.
3—A normal running landing should be made.
4—Make a running landing using partial power and left cyclic.

1365. Under what condition should a helicopter pilot consider using a running takeoff?

1—If the helicopter cannot be lifted vertically.
2—When a normal climb speed is assured between 10 and 20 ft.
3—When the additional airspeed can be quickly converted to altitude.
4—When gross weight or density altitude prevents a sustained hover at normal hovering altitude.

1366. What is the procedure for a slope landing?

1—Use maximum RPM and maximum manifold pressure.
2—When parallel to the slope, slowly lower the downslope skid to the ground prior to lowering the upslope skid.
3—If the slope is 10° or less, the landing should be made perpendicular to the slope.
4—When parallel to the slope, slowly lower the upslope skid to the ground prior to lowering the downslope skid.

1367. Takeoff from a slope is normally accomplished by

1—simultaneously applying collective pitch and downslope cyclic control.
2—bringing the helicopter to a level attitude before completely leaving the ground.
3—making a downslope running takeoff if the surface is smooth.
4—rapidly increasing collective pitch and upslope cyclic controls to avoid sliding downslope.

1368. The proper action to initiate a quick stop is to

1—increase the RPM.
2—decrease the RPM.
3—apply aft cyclic.
4—raise the collective pitch.

1369. Which is a precaution to be observed during an autorotative descent?

1—The rotor RPM will have a tendency to decrease if a tight turn is made with a heavily loaded helicopter.
2—A zero airspeed descent should never be made.
3—The collective pitch control should always be used to control the rate of descent.
4—Normally only the cyclic control is used to make turns.

1370. Which is an advantage of using a CG hook for a winch tow rather than the nose hook?

1—The control stick force (elevators) is less with the CG hook.
2—The sailplane is less likely to pitch up should the towline or a safety link break.
3—A shallower climb angle can be used during launch.
4—The wing loading is increased.

1371. To stop pitch oscillation (porpoising) during a winch launch, the pilot should

1—increase the back pressure on the control stick and steepen the angle of climb.
2—extend and retract the spoilers several times until the oscillations subside.
3—relax the back pressure on the control stick and shallow the angle of climb.
4—apply back stick pressure when the nose pitches downward and forward pressure when the nose pitches up.

1372. What corrective action should the sailplane take during takeoff if the towplane is still on the ground and the sailplane is airborne and drifting to the left?

1—Crab into the wind by holding upwind (right) rudder pressure.
2—Establish a right wing low drift correction to remain in the flightpath of the towplane.
3—Wait until the towplane becomes airborne before attempting to establish a drift correction.
4—Crab into the wind to maintain a position directly behind the towplane.

1373. During an aerotow, the sailplane moves to one side of the towplane's flightpath. This was most likely caused by

1—flying the sailplane in a wing–low attitude or holding unnecessary rudder pressure.
2—variations in the heading of the towplane.
3—entering wingtip vortices created by the towplane.
4—the towplane's slipstream striking the side of the sailplane's fuselage.

1374. In which manner should the sailplane be flown while turning during an aerotow?

1—By using a slightly steeper bank than the towplane with the sailplane's nose pointed to the outside of the turn.
2—By flying outside the towplane's flightpath.
3—By banking at the same point in space where the towplane banked and using the same degree of bank and rate of roll.
4—By flying inside the towplane's flightpath.

1375. Signal A in Figure 38, when seen on the ground, means

1—release towline.
2—ready to tow.
3—hold position.
4—take up slack.

1376. Which illustration in Figure 38 is a signal that the glider is unable to release?

1—E or F.
2—J.
3—K.
4—L.

1377. Which illustration in Figure 38 is a signal to stop operation?

1—B.
2—C.
3—D.
4—G.

1378. Which illustration in Figure 38 is a signal to the towplane to reduce airspeed?

1—E or F.
2—J.
3—K.
4—L.

1379. What action should be taken when receiving the signal depicted in illustration H of Figure 38?

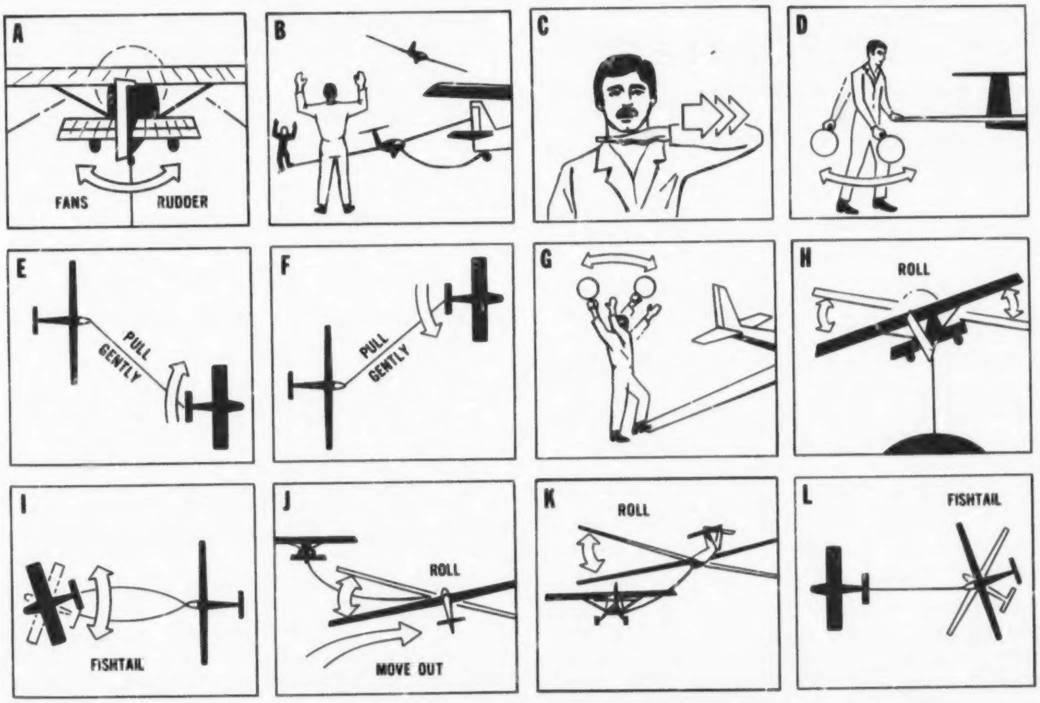
1—Hold position.
2—Take up slack.
3—Move out.
4—Release immediately.

1380. To obtain maximum distance over the ground in calm wind conditions, the airspeed to use is the

1—minimum control speed.
2—best L/D speed.
3—minimum sink speed.
4—maneuvering speed.

1381. What is the proper airspeed to use when flying between thermals on a cross-country flight against a headwind?

1—The best L/D speed increased by one-half the estimated wind velocity.
2—The minimum sink speed increased by one-half the estimated wind velocity.
3—The best L/D speed decreased by one-half the estimated wind velocity.
4—Maneuvering speed decreased by one-half the estimated wind velocity.



SELECTED STANDARD SOARING SIGNALS

Figure 38

1382. What corrective action snould be taken, if while thermalling at minimum sink speed in turbulent air, the left wing drops while turning to the left?

1—Apply more opposite (right) aileron pressure than opposite (right) rudder pressure to counteract the overbanking tendency.
2—Apply opposite (right) rudder pressure to slow the rate of turn.
3—Lower the nose before applying opposite (right) aileron pressure.
4—Apply opposite (right) aileron pressure to counteract the overbanking tendency.

1383. A pilot unintentionally enters a steep diving spiral to the left. The proper way to recover from this attitude without overstressing the glider would be to

1—apply up–elevator pressure to raise the nose.
2—apply more up–elevator pressure and then use right aileron pressure to control the overbanking tendency.
3—relax the back pressure and shallow the bank; then apply up–elevator pressure until the nose has been raised to the desired position.
4—apply more up–pressure and right rudder pressure to reduce the rate of turn.

1384. What corrective action should be taken, if while thermalling at minimum sink speed in turbulent air, the right wing drops while turning to the right?

1—Apply more opposite (left) aileron pressure than opposite (left) rudder pressure to counteract the overbanking tendency.
2—Apply opposite (left) rudder pressure to slow the rate of turn.
3—Lower the nose before applying opposite (left) aileron pressure.
4—Apply opposite (left) pressure to counteract the overbanking tendency.

1385. Which is a recommended procedure for an off–field landing?

1—A recommended landing site would be a pasture.
2—If the field slopes, it is usually best to land uphill, even with a tailwind.
3—Always land into the wind even if landing downhill on a sloping field is necessary.
4—When landing, it is best to make a straight–in high approach using spoilers or S turns to lose altitude.

1386. What would be a proper action or procedure to use if the pilot is getting too low on a cross–country flight in a sailplane?

1—Continue on course until descending to 1,000 ft. above the ground and then plan the landing approach.
2—Fly directly into the wind and make a straight–in approach at the end of the glide.
3—Continue on course until descending to 500 ft., then select a field and confine the search for lift to an area within gliding range of a downwind leg for the field chosen.
4—Have a suitable landing area selected upon reaching 2,000 ft. AGL, and a specific field chosen upon reaching 1,500 ft. AGL.

1387. When filling the aircraft fuel tanks with propane, precautions should be taken because

1—of the high pressure under which propane is transferred from the storage tanks to the aircraft fuel tanks.
2—during transfer, propane reaches a high temperature and can cause severe burns.
3—propane is super–cold and may cause severe freeze burns.
4—propane in its initial state is a toxic gas and can cause asphyxiation.

1388. An ideal surface for a balloon launch site is

1—asphalt or concrete.
2—bare earth.
3—tall, dry grass.
4—lawn grass.

1389. The minimum size a launch site should be is at least

1—twice the height of the balloon.
2—100 ft. for every 1 kt. of wind.
3—500 ft. on the downwind side.
4—twice the height of the tallest obstacle.

1390. It may be possible to make changes in the direction of flight in a hot–air balloon by

1—using the maneuvering vent.
2—operating at different flight altitudes.
3—flying a constant atmospheric pressure gradient.
4—operating above the friction level if there is no gradient wind.

1391. Best fuel economy in level flight can be accomplished by

1—riding the haze line in a temperature inversion.
2—short blasts of heat at high frequency.
3—long blasts of heat at low frequency.
4—short blasts of heat at low frequency.

1392. What action is most appropriate when an envelope over–temperature condition occurs?

1—Throw all unnecessary equipment overboard.
2—Descend; hover in ground effect until the envelope cools.
3—Turn the main burner OFF.
4—Land as soon as practical.

1393. What is a recommended ascent upon initial launch?

1—Maximum ascent to altitude to avoid low–level thermals.
2—Shallow ascent to avoid flashbacks of flames as the envelope is cooled.
3—A moderate–rate ascent to determine wind directions at different levels.
4—A gradual accelerated ascent to test the fuel valves.

1394. How should a round-out from a moderate-rate ascent to level flight be made?

1—Cool the envelope by venting just before arriving at altitude.
2—Cool the envelope by venting and add heat just before arriving at altitude.
3—Vent at altitude and add heat upon settling back down to altitude.
4—Reduce the amount of heat gradually as the balloon is approaching altitude.

1395. What is a potential hazard when climbing at maximum rate?

1—The envelope may collapse.
2—Deflation ports will be forced open.
3—The rapid flow of air may extinguish the burner and pilot light.
4—The envelope will cool too rapidly and destroy the efficiency of the climb.

1396. What is a hazard of rapid descents?

1—The parachute effect may put undue stress on the envelope.
2—The pilot light cannot remain lit with the turbulent air over the basket.
3—Aerodynamic forces may collapse the envelope.
4—The mouth may close when passing through shears.

1397. The windspeed is such that it is necessary to deflate the envelope as rapidly as possible during a landing. When should the deflation port (rip panel) be opened?

1—The instant the gondola contacts the surface.
2—As the balloon skips off the surface the first time and the last of the ballast has been discharged.
3—After ground contact has been firmly established and the envelope is swinging to the downward side of the gondola.
4—Prior to ground contact.

1398. When landing a free balloon, what should the occupants do to minimize landing shock?

1—Be seated on the floor of the basket.
2—Stand with knees slightly bent, in the center of the gondola, facing the direction of movement.
3—Stand back-to-back and hold onto the load ring.
4—Hold onto the handles attached to the load ring.

1399. Which precaution should be exercised if confronted with the necessity of having to land when the air is turbulent?

1—Land in any available lake close to the upwind shore.
2—Throw propane equipment overboard immediately prior to touchdown.
3—Land in the trees to absorb shock forces, thus cushioning the landing.
4—Land in the center of the largest available field.

1400. Prior to a high-wind landing, the pilot in command should brief the passengers to

1—kneel on the floor facing aft.
2—crouch on the floor and jump out of the basket on first contact with the ground.
3—crouch facing aft and jump out of the basket as soon as the basket stops moving.
4—crouch, hang on in two places, and remain in the basket until advised otherwise.

1401. What is the procedure for relighting the burner while in flight?

1—Open the regulator or blast valve full open and light off the pilot light.
2—Close the tank valves, vent off fuel lines, reopen tank valves, and light off the pilot light.
3—Open another tank valve, open the regulator or blast valve, and light off main jets with reduced flow.
4—Open the regulator valve full open, close main tank valve, open the regulator or blast valve, and light off pilot light.

1402. Which of the following takeoff procedures is considered to be most hazardous?

1—Maintaining only 50 percent of the maximum permissible positive angle of inclination.
2—Failing to apply full engine power properly on all takeoffs, regardless of wind.
3—Maintaining a negative angle of inclination during takeoff after elevator response is adequate for controllability.
4—Maintaining a light tailwheel contact when taking off in a light wind with a heavy airship.

1403. Which action is necessary in order to perform a normal descent in an airship?

1—Valve gas.
2—Valve air.
3—Take air into the aft ballonets.
4—Decrease the engine power.

1404. To land an airship that is 250 lb. heavy when the wind is calm, the best landing can usually be made if the airship is

1—in trim.
2—nose heavy approximately 20°.
3—tail heavy approximately 20°.
4—nose heavy 5°.

1405. What is the general direction of movement of the other aircraft during a night flight if you observe a steady red light and a flashing red light ahead and at the same altitude?

1—The other aircraft is crossing to the left.
2—The other aircraft is crossing to the right.
3—The other aircraft is approaching head-on.
4—The other aircraft is headed away from you.

1406. What is the general direction of movement of the other aircraft if during a night flight you observe a steady white light and a flashing red light ahead and at the same altitude?

1—The other aircraft is crossing to the left.
2—The other aircraft is crossing to the right.
3—The other aircraft is approaching head-on.
4—The other aircraft is headed away from you.

1407. What is the general direction of movement of the other aircraft if during a night flight you observe steady red and green lights ahead and at the same altitude?

1—The other aircraft is crossing to the left.
2—The other aircraft is crossing to the right.
3—The other aircraft is approaching head-on.
4—The other aircraft is headed away from you.

1408. VFR approaches to land at night should be made

1—at a higher airspeed.
2—low and shallow.
3—with a steep descent.
4—the same as during daytime.

1409. When starting an airplane engine by hand, it is extremely important that a competent pilot

1—call "contact" before touching the propeller.
2—be at the controls in the cockpit.
3—in the cockpit be in charge and call out all commands.
4—turn the propeller and call out all commands.

1410. Wingtip vortices, the dangerous turbulence that might be encountered behind a large aircraft, are created only when that aircraft is

1—operating at high airspeeds.
2—heavily loaded.
3—developing lift.
4—using high-power settings.

1411. Wingtip vortices created by large aircraft tend to

1—sink below the aircraft generating the turbulence.
2—rise into the traffic pattern.
3—rise into the takeoff or landing path of a crossing runway.
4—accumulate at the beginning of the takeoff roll.

1412. After takeoff, which airspeed would permit the pilot to gain the most altitude in a given period of time?

1—Cruising climb speed.
2—Best rate-of-climb speed.
3—Best angle-of-climb speed.
4—Minimum control speed.

1413. Which would provide the greatest gain in altitude in the shortest distance during climb after takeoff?

1—Steepest pitch attitude.
2—Cruising climb speed.
3—Best rate-of-climb speed.
4—Best angle-of-climb speed.

1414. When taking off or landing at a busy airport where large heavy aircraft are operating, one should be particularly alert to the hazards of wingtip vortices because this turbulence tends to

1—rise from a crossing runway into the takeoff or landing path.
2—rise into the traffic pattern area surrounding the airport.
3—sink into the flightpath of aircraft operating below the aircraft generating the turbulence.
4—accumulate at the beginning of the takeoff roll.

1415. What action can a pilot take to aid in cooling an engine that is overheating during a climb?

1—Lean the mixture to best power condition.
2—Increase RPM and reduce climb speed.
3—Reduce rate of climb and increase airspeed.
4—Increase RPM and climb speed.

1416. What is one procedure to aid in cooling an engine that is overheating?

1—Enrichen the fuel mixture.
2—Increase the RPM.
3—Reduce the airspeed.
4—Use alternate air.

1417. The most important rule to remember in the event of a power failure after becoming airborne is to

1—quickly check the fuel supply for possible fuel exhaustion.
2—determine the wind direction to plan for the forced landing.
3—turn back immediately to the takeoff runway.
4—maintain safe airspeed.

1418. If power failure occurs at altitude, the pilot should immediately

1—center the pedals.
2—apply left pedal to correct for yaw.
3—lower the collective pitch control.
4—hold the collective pitch control in the neutral position.

1419. The sailplane has become airborne and the towplane loses power before leaving the ground. The sailplane should release immediately,

1—and maneuver to the right of the towplane.
2—extend the spoilers, and land straight ahead.
3—maneuver to the left of the towplane, and stop as quickly as possible.
4—extend the spoilers, and land. If a crosswind exists, the sailplane pilot should make a gentle turn into the wind.

1420. If an airship should experience failure of both engines during flight and neither engine can be restarted, what initial immediate action must the pilot take?

1—The airship must be driven down to a landing before control and envelope shape are lost.
2—The emergency auxiliary power unit must be started for electrical power to the airscoop blowers so that ballonet inflation can be maintained.
3—Immediate preparations to operate the airship as a free balloon are necessary.
4—Valve large quantities of helium so that an immediate descent to an emergency landing can be accomplished.

1421. The segmented circle shown in Figure 39 indicates that the airport traffic is

1—left-hand for Rwy 17 and right-hand for Rwy 35.
2—right-hand for Rwy 9 and left-hand for Rwy 27.
3—right-hand for Rwy 35 and right-hand for Rwy 9.
4—left-hand for Rwy 35 and right-hand for Rwy 17.

1422. The traffic patterns indicated in the segmented circle depicted in Figure 39 have been arranged to avoid flights over an area to the

1—south of the airport.
2—north of the airport.
3—southeast of the airport.
4—northwest of the airport.

1423. The segmented circle depicted in Figure 39 indicates that a landing on Rwy 26 will be with a

1—right-quartering headwind.
2—left-quartering headwind.
3—right-quartering tailwind.
4—left-quartering tailwind.

1424. Which runway and traffic pattern should be used as indicated by the wind cone in the segmented circle depicted in Figure 39?

1—Right-hand traffic on Rwy 35.
2—Right-hand traffic on Rwy 17.
3—Left-hand traffic on Rwy 35 or right-hand traffic on Rwy 26.
4- Left-hand traffic on Rwy 26 or Rwy 35.

1425. An airport's rotating beacon operated during the daylight hours indicates

1—there are obstructions on the airport.
2—that weather in the control zone is below basic VFR weather minimums.
3—parachute jumping is in progress.
4—the airport is temporarily closed.

1426. A lighted heliport may be identified by

1—a flashing yellow light.
2—a blue lighted square landing area.
3—white and red lights.
4—a green, yellow, and white rotating beacon.

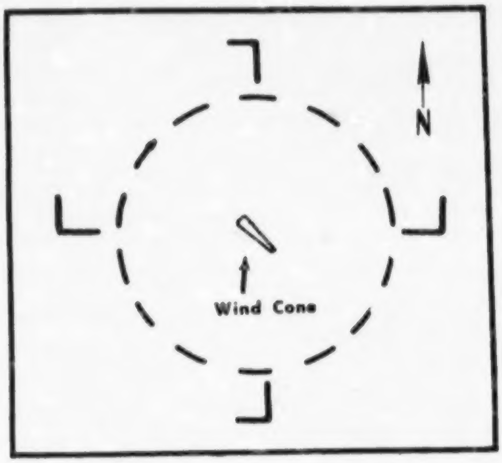


Figure 39

1427. An on glide slope indication from a tri-color VASI is

1—a white light signal.
2—a green light signal.
3—an amber light signal.
4—a pink light signal.

1428. An above glide slope indication from a tri-color VASI is

1—a white light signal.
2—a green light signal.
3—an amber light signal.
4—a pink light signal.

1429. A below glide slope indication from a tri-color VASI is

1—a pink light signal.
2—a green light signal.
3—an amber light signal.
4—a red light signal.

1430. When approaching to land on a runway served by a VASI, the pilot shall

1—intercept and remain on the glide slope until touchdown only if the aircraft is operating on an instrument flight plan.
2—maintain an altitude that captures the glide slope at least 2 mi. downwind from the runway threshold.
3—maintain an altitude at or above the glide slope.
4—remain on the glide slope and land between the two-light bar.

1431. Airport taxiways are identified at night by

1—alternate red and green edge lights.
2—amber omnidirectional edge lights.
3—white directional edge lights.
4—blue omnidirectional edge lights.

1432. Illustration A in Figure 40 indicates that an aircraft is

1—off course.
2—below the glide slope.
3—on the glide slope.
4—above the glide slope.

1433. While on final approach to a runway equipped with a standard 2-bar VASI, the lights appear as shown by Illustration D in Figure 40. This means that the pilot is

1—receiving an erroneous light indication.
2—above the glide slope.
3—below the glide slope.
4—on the glide slope.

1434. VASI lights appearing as shown by Illustration C in Figure 40 would indicate that an airplane is

1—off course to the left.
2—on the glide slope.
3—below the glide slope.
4—above the glide slope.

1435. That portion of the runway identified by the letter A in Figure 41

1—may be used for taxiing but should not be used for takeoffs or landings.
2—may be used for taxiing or takeoffs but not for landings.
3—may be used for taxiing, takeoffs, and landings.
4—may not be used except in an emergency.

1436. According to the airport diagram shown in Figure 41,

1—takeoffs and landings are permissible at position C since this is a short takeoff and landing runway.
2—the takeoff and landing portion of Rwy 12 begins at position B.
3—Rwy 30 is equipped at position E with emergency arresting gear to provide a means of stopping military aircraft.
4—takeoffs may be started at position A on Rwy 12, and the landing portion of this runway begins at position B.

1437. What is the difference between area "A" and area "E" on the airport depicted in Figure 41?

1—"A" may be used for taxi and takeoff; "E" may be used only as an overrun.
2—"A" may be used for all operations except heavy aircraft landings; "E" may be used only as an overrun.
3—"A" may be used only for taxiing; "E" may be used for all operations except landings.
4—"A" may be used only for an overrun; "E" may be used only for taxi and takeoff.

1438. Area C on the airport depicted in Figure 41 is classified as

1—an STOL runway.
2—a parking ramp.
3—a multiple heliport.
4—a closed runway.

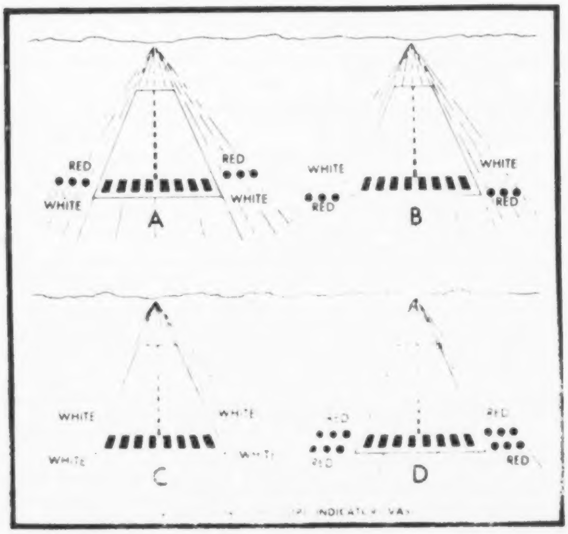


Figure 40

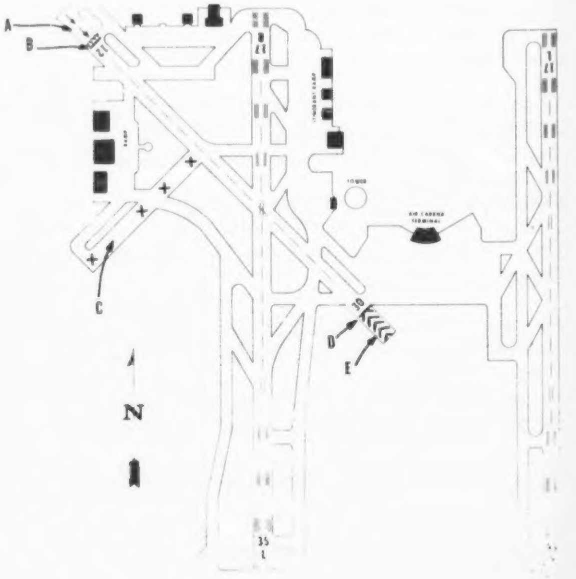


Figure 41

1439. Select the proper traffic pattern and runway for a landing as indicated on the airport diagram in Figure 42.

1—Right-hand traffic and Rwy 4.
2—Right-hand traffic and Rwy 18.
3—Left-hand traffic and Rwy 22.
4—Left-hand traffic and Rwy 36.

1440. If the wind is as shown by the landing direction indicator in Figure 42, the pilot should land to the

1—north on Rwy 36 and expect a crosswind from the right.
2—south on Rwy 18 and expect a crosswind from the right.
3—southwest on Rwy 22 directly into the wind.
4—northeast on Rwy 4 directly into the wind.

1441. The arrows that appear on the end of the north/south runway as shown in Figure 42 indicate that the area

1—may be used only for taxiing.
2—is usable for taxiing, takeoff, and landing.
3—cannot be used for landing, but may be used for taxiing and takeoff.
4—is available for landing at the pilot's discretion.

1442. The numbers 9 and 27 on a runway indicate that the runway is oriented approximately

1—090° and 270° magnetic.
2—009° and 027° true.
3—090° and 270° true.
4—009° and 027° magnetic.

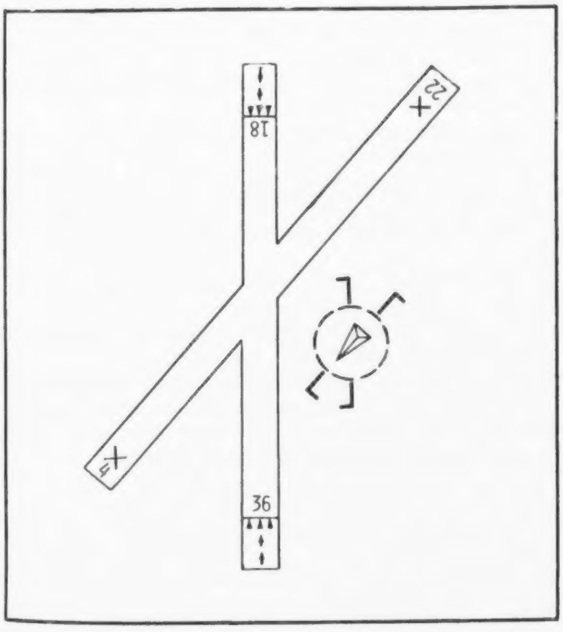


Figure 42

1443. How is a runway recognized as being closed?

1—The letter C is painted in red after the runway number.
2—Red lights are placed at the approach end of the runway.
3—Yellow chevrons are painted on the runway beyond the threshold.
4—X is displayed on the runway.

1444. A free balloon flight through a restricted area is

1—permitted at certain times, but only with prior permission by the appropriate authority.
2—permitted anytime, but caution should be exercised because of high-speed military aircraft.
3—never permitted.
4—never permitted below 10,000 ft. AGL.

1445. Under what condition, if any, may civil pilots enter a restricted area?

1—For takeoff and landing to take care of official business.
2—With the controlling agency's authorization.
3—On airways with ATC clearance.
4—Under no condition.

1446. When operating VFR in a MOA, a pilot

1—must obtain a clearance from the controlling agency prior to entering the MOA.
2—may operate only on the airways that transverse the MOA.
3—should exercise extreme caution when military activity is being conducted.
4—must operate only when military activity is not being conducted.

1447. Who is responsible for collision avoidance in an alert area?

1—The controlling agency.
2—All pilots, without exception.
3—Only the pilots transitioning the area.
4—All pilots except those participating in the training operations.

1448. What minimum altitude is requested for aircraft over national wildlife refuges?

1—500 ft. AGL.
2—1,000 ft. AGL.
3—2,000 ft. AGL.
4—3,000 ft. AGL.

1449. Basic radar service in the terminal radar program is best described as

1—traffic advisories and limited vectoring to VFR aircraft.
2—mandatory radar service provided by the ARTS program.
3—wind shear warning at participating airports.
4—sequencing and separation service to IFR aircraft.

1450. How can a military airport be identified at night?

1—Alternate white and green beacon light flashes.
2—Dual peaked (two quick) white flashes between intermittent green flashes.
3—White flashing beacon lights with steady green at the same location.
4—Alternate white and red beacon light flashes.

1451. Stage III service in the terminal radar program provides

1—IFR separation (1,000 ft. vertical and 3 mi. lateral) between all aircraft.
2—warning to pilots when their aircraft are in unsafe proximity to terrain, obstructions, or other aircraft.
3—sequencing and separation for participating VFR aircraft.
4—service to aircraft principally during the en route phase of flight.

1452. From whom should a departing VFR aircraft request Stage II Terminal Radar Advisory Service during ground operations?

1—The nearest FSS.
2—Clearance delivery.
3—Tower controller, just before takeoff.
4—Ground control, on initial contact.

1453. If radar traffic information is desired, which action should a pilot take prior to entering a TRSA?

1—Prior to entering the TRSA, contact approach control on the appropriate frequency.
2—Contact the tower and request permission to enter the TRSA.
3—Maintain an altitude below 2,000 ft. AGL prior to entering the TRSA.
4—Maintain an altitude at or below 3,000 ft. AGL until entering the airport control zone, then make initial contact with approach control for radar service.

1454. All operations within an Airport Radar Service Area (ARSA) must

1—be conducted under instrument flight rules.
2—be in compliance with ATC clearances and instructions.
3—be in an aircraft equipped with a 4096 transponder with mode C capability.
4—file a flight plan prior to arrival or departure.

1455. If air traffic control advises that radar service is being terminated when the pilot is departing a terminal radar service area, the transponder should be set to code

1—0000.
2—1200.
3—4096.
4—7700.

1456. What are the horizontal limits of an airport traffic area?

1—3 SM from the airport boundary.
2—5 SM from the airport boundary.
3—5 SM from the geographical center of the airport.
4—3 SM from the geographical center of the airport.

1457. The vertical limit of an airport traffic area is from the surface up to

1—and including 1,500 ft.
2—and including 2,000 ft.
3—but not including 3,000 ft.
4—the base of the overlying control area.

1458. Prior to entering an airport advisory area, a pilot

1—must obtain a clearance from air traffic control.
2—should monitor ATIS for weather and traffic advisories.
3—should contact approach control for vectors to the traffic pattern.
4—should contact the local FSS for airport and traffic advisories.

1459. Select the UNICOM frequencies normally assigned to stations at landing areas used exclusively as heliports.

1—122.7 and 122.8 MHz.
2—122.7 and 122.05 MHz.
3—123.0 and 123.9 MHz.
4—123.05 and 123.075 MHz.

1460. ATIS is the continuous broadcast of recorded information

1—alerting pilots of radar-identified aircraft when their aircraft is in dangerous proximity to terrain or an obstruction.
2—concerning nonessential information to reduce frequency congestion.
3—concerning noncontrol information in selected high-activity terminal areas.
4—concerning sky conditions limited to ceilings below 1,000 ft. and visibilities less than 3 mi.

1461. How should a VFR flight plan be closed at the completion of the flight at a controlled airport?

1—The tower will automatically close the flight plan when the aircraft turns off the runway.
2—The pilot must close the flight plan with the nearest FSS or other FAA facility upon landing.
3—The tower will relay the instructions to the nearest FSS when the aircraft contacts the tower for landing.
4—The pilot should close the flight plan with ground control while taxiing to the parking ramp.

1462. After landing at a tower-controlled airport, when should the pilot contact ground control?

1—Prior to turning off the runway.
2—After reaching a taxiway that leads directly to the parking area.
3—After leaving the runway and crossing the runway holding lines.
4—When advised by the tower to do so.

1463. If instructed by ground control to taxi to Rwy 9, the pilot may proceed

1—via taxiways and across runways to, but not onto, Rwy 9.
2—to the next intersecting runway where further clearance is required.
3—via taxiways and across runways to Rwy 9, where an immediate takeoff may be made.
4—via any route at the pilot's discretion onto Rwy 9 and hold until cleared for takeoff.

1464. Under what condition may an aircraft operate from a satellite airport within an Airport Radar Service Area (ARSA)?

1—The pilot must file a flight plan prior to departure.
2—The pilot must monitor ATC until clear of the ARSA.
3—The pilot must contact ATC as soon as practicable after takeoff.
4—The pilot must secure prior approval from ATC before takeoff from the satellite airport.

1465. While flying on an east heading, a radar ATC facility issues the following warning:

"TRAFFIC 3 O'CLOCK, 2 MILES, WESTBOUND . . . ."

The pilot should look for this traffic in the direction of the airplane's

1—left wingtip, and ahead of the wing.
2—left wingtip.
3—right wingtip.
4—nose and slightly to the right..

1466. While flying north, a radar ATC facility issues the following warning:

"TRAFFIC 10 O'CLOCK, 2 MILES, SOUTHBOUND . . . ."

The pilot would look for this traffic in a direction approximately

1—10° behind the left wing of the airplane.
2—60° to the left of the nose of the airplane.
3—30° to the right of the nose of the airplane.
4—20° to the left of the nose of the airplane.

1467. During a flight, a radar controller advises:

"TRAFFIC 2 O'CLOCK, 5 MILES, NORTHBOUND . . . ."

Where should the pilot look for the traffic?

1—Just ahead of the right wingtip.
2—Slightly to the right of the airplane's nose.
3—Straight ahead.
4—Just ahead of the aircraft's left wingtip.

1468. While flying on a north heading in calm wind, radar controller advises:

"TRAFFIC 9 O'CLOCK, 2 MILES, SOUTHBOUND . . . ."

The pilot should look for this traffic

1—behind the right wingtip.
2—off the left wingtip.
3—ahead of the left wingtip.
4—off the right wingtip.

1469. Below FL180, en route weather advisories should be obtained from an FSS on

1—122.1 MHz.
2—122.0 MHz.
3—123.6 MHz.
4—122.4 MHz.

1470. If the aircraft's radio fails, what is the recommended procedure when landing at a controlled airport?

1—Observe the traffic flow, enter the pattern, and look for a light signal from the tower.
2—Enter a crosswind leg and rock the wings.
3—Flash the landing lights and cycle the landing gear while circling the airport.
4—Select 7700 on the transponder and fly a normal traffic pattern.

1471. When activated, an ELT transmits on

1—122.3 and 122.8 MHz.
2—123.0 and 119.0 MHz.
3—121.5 and 243.0 MHz.
4—118.0 and 118.8 MHz.

1472. Operational tests of the ELT should be made only

1—during the first 5 min. of the hour.
2—during the annual inspection.
3—after one-half the shelf life of the battery.
4—upon replacing the battery.

1473. Which procedure is recommended to ensure that the ELT has not been activated?

1—Turn off the aircraft ELT after landing.
2—Ask the airport tower if they are receiving an ELT signal.
3—Monitor 121.5 before engine shutdown.
4—Have a certified repair station inspect the ELT.

1474. When approaching Lincoln Municipal (Figure 43) from the west at noon for the purpose of landing, the initial communications should be with

1—Lincoln Approach Control on 124.0 MHz.
2—Minneapolis Center Approach Control on 128.75 MHz.
3—Lincoln Tower on 118.5 MHz.
4—Lincoln Approach Control on 124.8 MHz.

1475. Which type radar service is listed for Lincoln Municipal? (See Figure 43.)

1—Radar advisory and sequencing service for IFR aircraft only.
2—Radar advisory for VFR traffic and sequencing service for IFR aircraft.
3—Radar sequencing and separation for participating VFR aircraft.
4—Radar sequencing and separation service for all aircraft.

1476. Traffic patterns in effect at McCook Municipal (Figure 43) are

1—left-hand on all runways.
2—left-hand on Rwy 12, Rwy 21, and Rwy 30; right-hand on Rwy 03.
3—right-hand on all runways.
4—right-hand on the concrete runways and left-hand on the turf runways.

1477. Where is Loup City Municipal located with relation to the city? (See Figure 43.)

1—Northeast approximately 3 mi.
2—Northwest approximately 1 mi.
3—East approximately 10 mi.
4—250°, 29.3 NM.

1478. What is the recommended communications procedure for landing at Lincoln Municipal during the hours when the tower is not in operation? (See Figure 43.)

1—Contact UNICOM on 122.95 MHz for traffic advisories.
2—Monitor ATIS for airport conditions, then announce position on 122.95 MHz.
3—Request advisories and sequencing from Minneapolis Center Approach Control.
4—Contact the Lincoln FSS on 118.5 MHz for traffic advisories.

1479. The most effective method of scanning for other aircraft for collision avoidance during daylight hours is to use

1—regularly spaced concentration on the 3-, 9-, and 12-o'clock positions.
2—a series of short, regularly spaced eye movements to search each 10-degree sector.
3—peripheral vision by scanning small sectors and utilizing offcenter viewing.
4—rapid head and eye movements through a horizontal plane to cover the entire viewing area in a short time.

1480. The most effective method of scanning for other aircraft for collision avoidance during nighttime hours is to use

1—regularly spaced concentration on the 3-, 9-, and 12-o'clock positions.
2—a series of short, regularly spaced eye movements to search each 30-degree sector.
3—peripheral vision by scanning small sectors and utilizing offcenter viewing.
4—rapid head and eye movements through a horizontal plane to cover the entire viewing area in a short time.

1481. How can you determine if another aircraft is on a collision course with your aircraft?

1—The other aircraft will be pointed directly at your aircraft.
2—The other aircraft will always appear to get larger and closer at a rapid rate.
3—The nose of each aircraft is pointed at the same point in space.
4—There will be no apparent relative motion between your aircraft and the other aircraft.

1482. Prior to starting each maneuver, a pilot should

1—check altitude, airspeed, and heading indications.
2—visually scan the area below your aircraft in case of an accidental stall or spin.
3—advise ATC of your intentions so as to receive timely traffic advisories.
4—visually scan the entire area for collision avoidance.

1483. What procedure is recommended when climbing or descending VFR on an airway?

1—Advise the nearest FSS of the altitude changes.
2—Offset 4 mi. or more from the centerline of the airway before changing altitude.
3—Squawk 1400 on the transponder with mode C selected.
4—Execute gentle banks, left and right for continuous visual scanning of the airspace.

NEBRASKA

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§ **LINCOLN MUNI** (LNK) 4 NW GMT-6(-5DT) 40°51'03"N 96°45'32"W **OMAHA**
1214 B S4 **FUEL** 100, 100LL, JET A1 + CFR Index B **H-1D, 3A, L-11B**
RWY 17R-35L: H12901X200 (ASPH-CONC-AFSC) S-100, D-200, DT-400 HIRL **IAP**
RWY 17R: MALSR. VASI(V4L). Rgt tfc. Arrest device **RWY 35L:** MALSR. VASI(V4L). Arrest device.
RWY 14-32: H8620X150 (ASPH-CONC-AFSC) S-80, D-170, DT-280 MIRL
RWY 14: REIL. VASI(4VL)—GA 3.0°TCH 48'.
RWY 32: VASI(4VL)—GA 3.0°TCH 53'. Thld dsplcd 442'. Pole.
RWY 17L-35R: H5500X100 (ASPH-CONC-AFSC) S-49, D-60 HIRL .8% up N
RWY 17L: VASI(V4L)—GA 3.0°TCH 33'. Trees.
RWY 35R: VASI(V4L)—GA 3.0°TCH 35'. Light standard. Rgt tfc.
AIRPORT REMARKS: Attended continuously. Arresting barrier located 2200' in from thld 17R and 1500' in from thld 35L. Arresting barrier in place departure end Rwy 17R-35L during military operations and approach end during emergencies. Airport manager advise 43000 lbs GWT single wheel Rwy 17L-35R. For MALS ctc Tower.
COMMUNICATIONS: CTAF 118.5 **ATIS** 118.05 **UNICOM** 122.95
LINCOLN FSS (LNK) on arpt. 122.65 122.2 LD (402) 477-3929. NOTAM FILE LNK.
Ⓡ **APP/DEP CON** 124.0 (170°-349°) 124.8 (350°-169°) (1200-0500Z‡)
Ⓡ **MINNEAPOLIS CENTER APP/DEP CON** 128.75 (0500-1200Z‡)
TOWER 118.5 125.7 (1200-0500Z‡) **GND CON** 121.9 **CLNC DEL** 120.7
STAGE III ctc **APP CON**
RADIO AIDS TO NAVIGATION: NOTAM FILE LNK. VHF/DF ctc LINCOLN FSS
(H) VORTAC 116.1 LNK Chan 108 40°55'26"N 96°44'30"W 185°3.8 NM to fld. 1370/9E.
LEMMS NDB (MHW/LOM) 385 LN 40°44'50"N 96°45'44"W 354°4.8 NM to fld. Unmonitored.
ILS 111.1 I-OCZ Rwy 17R
ILS 109.9 I-LNK Rwy 35L LOM LEMMS NDB. LOM
COMM/NAVAID REMARKS: Freq 121.5 not available at tower.

LOUP CITY MUNI (NEØ3) 1 NW GMT-6(-5DT) 41°17'25"N 98°59'25"W **OMAHA**
2070 B **FUEL** 100LL **L-11B**
RWY 15-33: H3200X50 (ASPH) S-8 LIRL
RWY 33: Trees.
RWY 04-22: 2100X100 (TURF)
RWY 04: Trees. **RWY 22:** Road
AIRPORT REMARKS: Attended Mon-Sat 1500-1800Z‡. For service other hours call (308) 745-1131.
COMMUNICATIONS: CTAF 122.9
GRAND ISLAND FSS (GRI) Toll free call dial (800) 652-9420.
RADIO AIDS TO NAVIGATION: NOTAM FILE GRI.
WOLBACH (H) VORTAC 114.8 OBH Chan 95 41°22'33"N 98°21'12"W 250°29.3 NM to fld. 2010/10E.

MARTIN FLD (See SO SIOUX CITY)

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§ **McCOOK MUNI** (MCK) 2 E GMT-6(-5DT) 40°12'23"N 100°35'29"W **OMAHA**
2579 B S4 **FUEL** 80, 100, 100LL, JET A CFR Index A **H-1D, 3A, L-11A**
fssRWY 12-30: H5998X100 (CONC) S-30, D-38 MIRL 6% up NW **IAP**
RWY 12: MALS. VASI(V4L)—GA 3.0°TCH 33.7'. Tree **RWY 30:** REIL. VASI(V4L)—GA 3.0°TCH 42'
RWY 03-21: H3999X75 (CONC) S-30, D-38 MIRL
RWY 03: VASI(V2L)—GA 3.0°TCH 26'. Rgt tfc. Road **RWY 21:** VASI(V2L)—GA 3.0°TCH 26'
RWY 17-35: 1500X200 (TURF)
AIRPORT REMARKS: Attended daylight hours. To activate MALS Rwy 12 key 122.8 3 times for low, 5 times for Med, 7 times for Hi. For VASI Rwy 12-30 key 122.8 3 times. Control Zone effective 1100-0500Z‡. Except Holidays. Closed to air carrier operations of aircraft with seating capacity over 30 passengers except with prior approval, call arpt manager 308-345-2022; 24 hours in advance.
COMMUNICATIONS: CTAF/UNICOM 122.8
NORTH PLATTE FSS (LBF) Toll free call dial (800) 662-2930 NOTAM FILE MCK
RCO 123.65R 110.0T (NORTH PLATTE FSS)
RADIO AIDS TO NAVIGATION: NOTAM FILE MCK.
HAYES CENTER (H) VORTAC 117.7 HCT Chan 124 40°27'15"N 100°55'23"W 124°21.3 NM to fld. 3010/11E. NOTAM FILE LBF.
(L) VOR 110.0 MCK 40°12'14"N 100°35'38"W at fld.

Figure 43

1484. If more than one cruising altitude is intended, which should be entered in Block 7 of the flight plan? (See Figure 44.)

1—Initial cruising altitude.
2—Highest cruising altitude.
3—Lowest cruising altitude.
4—Average of all cruising altitudes.

1485. The information that should be entered in Block 9 (Figure 44) for a VFR day flight is the

1—name of the airport of first intended landing.
2—name of destination airport if no stopover over 1 hr. is anticipated.
3—name of the airport where the aircraft is based.
4—names of all the airports where landings are to be made.

1486. What information should be entered in Block 12 (Figure 44) for a VFR day flight?

1—The estimated time en route plus 30 min.
2—The estimated time en route plus 45 min.
3—The maximum endurance time as shown in the Pilot's Operating Handbook.
4—The amount of usable fuel on board expressed in time.

1487. When making routine transponder code changes, pilots should avoid inadvertent selection of which codes?

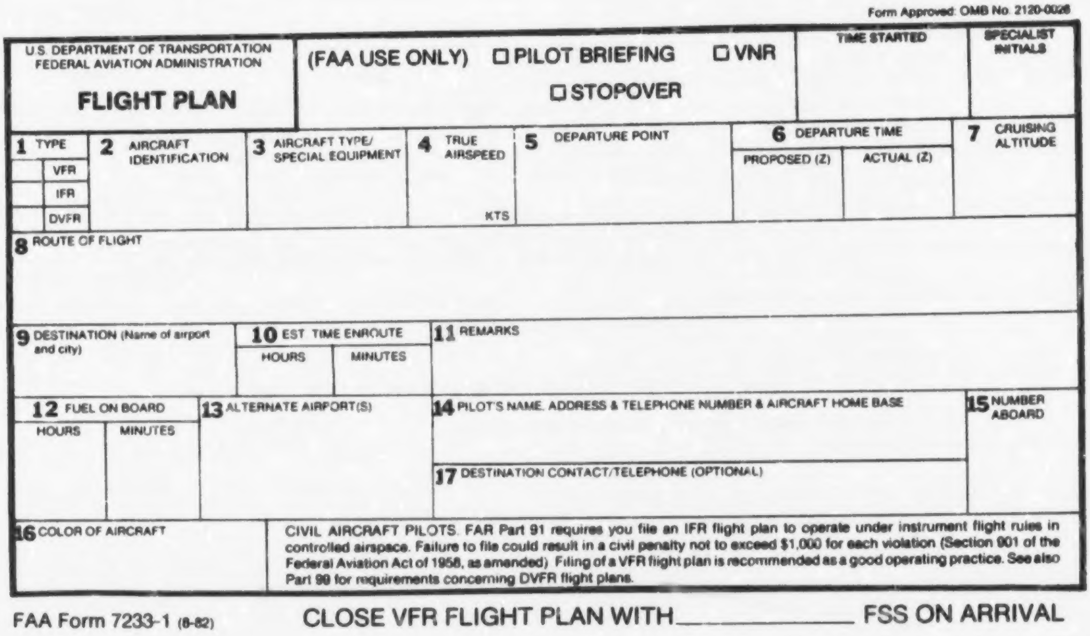
1—3100, 7600, 7700.
2—7500, 7600, 7700.
3—7000, 7600, 7700.
4—4000, 7600, 7700.

1488. In VFR conditions below 18,000 ft. MSL, what transponder code should be selected?

1—Code 1200, and the IDENT feature should not be engaged.
2—Code 1200, and the IDENT feature should be engaged.
3—Code 1400, and the IDENT feature should not be engaged.
4—Code 1400, and the IDENT feature should be engaged.

1489. The letters VHF/DF appearing in the Airport/Facility Directory for a certain airport indicate that

1—this airport is designated as an airport of entry.
2—the Flight Service Station has equipment with which to determine your direction from the station.
3—this airport has a direct-line phone to the Flight Service Station.
4—this airport is a defense facility.



Form Approved: OMB No. 2120-0026

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

FLIGHT PLAN

(FAA USE ONLY) ☐ PILOT BRIEFING ☐ VNR ☐ STOPOVER

TIME STARTED

SPECIALIST INITIALS

1 TYPE ☐ VFR ☐ IFR ☐ DVFR
2 AIRCRAFT IDENTIFICATION
3 AIRCRAFT TYPE/ SPECIAL EQUIPMENT
4 TRUE AIRSPEED KTS
5 DEPARTURE POINT
6 DEPARTURE TIME PROPOSED (Z) ACTUAL (Z)
7 CRUISING ALTITUDE
8 ROUTE OF FLIGHT
9 DESTINATION (Name of airport and city)
10 EST. TIME ENROUTE HOURS MINUTES
11 REMARKS
12 FUEL ON BOARD HOURS MINUTES
13 ALTERNATE AIRPORT(S)
14 PILOT'S NAME, ADDRESS & TELEPHONE NUMBER & AIRCRAFT HOME BASE
15 NUMBER ABOARD
16 COLOR OF AIRCRAFT
17 DESTINATION CONTACT/TELEPHONE (OPTIONAL)

CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

FAA Form 7233-1 (8-82) CLOSE VFR FLIGHT PLAN WITH ______________ FSS ON ARRIVAL

Figure 44

1490. To use VHF/DF facilities for assistance in locating an aircraft's position, the aircraft must have

1—a VHF transmitter and receiver.
2—an IFF transponder.
3—a VOR receiver and DME.
4—an ELT.

1491. What minimum condition must exist to operate within a control zone special VFR?

1—2400 RVR.
2—500 ft. below clouds.
3—1,000 ft. above clouds.
4—1 mi. flight visibility.

1492. Who should the pilot contact to receive a special VFR clearance in a control zone collocated with an airport traffic area?

1—FSS.
2—Airport control tower.
3—Air route traffic control center.
4—Approach control.

1493. If an aircraft is involved in an accident which resulted in substantial damage to the aircraft, the nearest NTSB field office should be notified

1—immediately.
2—within 5 days.
3—within 7 days.
4—within 10 days.

1494. Of the following incidents, which would necessitate an immediate notification to the nearest NTSB field office?

1—An in-flight generator/alternator failure.
2—An in-flight fire.
3—An in-flight loss of VOR receiver capability.
4—Ground damage to the propeller blades.

1495. Which of these incidents would require that an immediate notification be made to the nearest NTSB field office?

1—An overdue aircraft that is believed to be involved in an accident.
2—An in-flight radio (communication) failure.
3—An in-flight generator or alternator failure.
4—In-flight hail damage.

1496. Which incident requires an immediate notification to the nearest NTSB field office?

1—A forced landing due to engine failure.
2—Landing gear damage, due to a hard landing.
3—Inability of any required crewmember to perform normal flight duties due to in-flight injury or illness.
4—Substantial aircraft ground fire with no intention of flight.

1497. An aircraft is involved in an accident that results in substantial damage to the aircraft, but no injuries to the occupants. When must the pilot or operator of the aircraft notify the nearest NTSB field office of the occurrence?

1—Within 1 week.
2—Immediately.
3—Within 48 hr.
4—Within 10 days.

1498. The operator of an aircraft that has been involved in an accident is required to file an accident report within how many days?

1—3.
2—5.
3—7.
4—10.

1499. The operator of an aircraft that has been involved in an incident is required to submit a report to the nearest field office of the NTSB

1—within 3 days.
2—within 10 days.
3—within 7 days.
4—only if requested to do so.

1500. FAA Advisory Circulars (some free, others at cost) are available to all pilots and are obtained by

1—distribution from the nearest FAA district office.
2—ordering those desired.
3—subscribing to the Federal Register.
4—subscribing to FAR's.

1501. An airport traffic area is automatically in effect when

1—its associated control tower is in operation.
2—the weather is below VFR minimums.
3—nighttime hours exist.
4—radar service is available.

1502. The normal radius of the outer area of an Airport Radar Service Area (ARSA) is

1—5 SM.
2—5 NM.
3—15 NM.
4—20 NM.

1503. The vertical limit of an Airport Radar Service Area (ARSA) is

1—1,200 ft. AGL.
2—3,000 ft. AGL.
3—4,000 ft. above the primary airport.
4—up to, but not including 14,500 ft.

1504. Ceiling, as used in weather reports, is defined as the height above the Earth's surface of the

1—lowest reported obscuration and the highest layer of clouds reported as overcast.
2—lowest layer of clouds reported as broken or overcast and not classified as thin.
3—lowest layer of clouds reported as scattered, broken, or thin.
4—highest layer of clouds reported as broken or thin.

1505. Free balloon pilots must have in their personal possession a current pilot certificate when

1—carrying passengers only.
2—piloting for hire only.
3—acting as pilot in command.
4—acting as crew chief during weigh–off, launch, and recovery.

1506. Private pilots acting as pilot in command, or in any other capacity as a required pilot flight crewmember, must have in their personal possession while aboard the aircraft

1—a current logbook endorsement to show that a flight review has been satisfactorily accomplished.
2—the current and appropriate pilot and medical certificates.
3—a current endorsement on the pilot certificate to show that a flight review has been satisfactorily accomplished.
4—the pilot logbook to show recent experience requirements to serve as pilot in command have been met.

1507. When must a current pilot certificate be in the pilot's personal possession?

1—Only when operating in controlled airspace.
2—When acting as a crew chief during launch and recovery.
3—Only when passengers are carried.
4—Anytime when acting as pilot in command or a required crewmember.

1508. A Third–Class Medical Certificate was issued on August 10, this year. To exercise the privileges of a private pilot certificate, the medical certificate will be valid through

1—August 10, 3 yr. later.
2—August 10, 2 yr. later.
3—August 31, 3 yr. later.
4—August 31, 2 yr. later.

1509. To act as pilot in command of an aircraft with passengers aboard, the pilot must have made at least three takeoffs and three landings in an aircraft of the same category and class within the preceding

1—120 days.
2—90 days.
3—24 mo.
4—12 mo.

1510. What document(s) must be in your personal possession while operating as pilot in command of an aircraft?

1—A certificate showing accomplishment of a current flight review.
2—A certificate showing accomplishment of a checkout in the aircraft and a current flight review.
3—A pilot logbook with endorsements showing accomplishment of a current flight review and recency of experience.
4—An appropriate pilot certificate and a current medical certificate.

1511. A Third–Class Medical Certificate was issued on May 3, this year. To exercise the privileges of a private pilot certificate, the medical certificate will be valid through

1—May 31, 1 yr. later.
2—May 31, 2 yr. later.
3—May 3, 1 yr. later.
4—May 3, 2 yr. later.

1512. To act as pilot in command of an airplane that has more than 200 hp., a person is required to do which of the following, if no pilot–in–command time in a high–performance airplane was logged prior to November 1, 1973?

1—Make three solo takeoffs and landings in such an airplane.
2—Receive flight instruction in an airplane that has more than 200 hp.
3—Pass a flight test in such an airplane.
4—Hold a 200–hp. class rating.

1513. If recency of experience requirements for night flight are not met and official sunset is 1830, the latest time passengers may be carried is

1—1730.
2—1830.
3—1900.
4—1930.

1514. To meet the recent flight experience requirement for acting as pilot in command carrying passengers a night, a pilot must have made, within the precedin 90 days and at night, at least

1—three takeoffs and three landings to a full stop in th same category and class of aircraft to be used.
2—three touch–and–go landings in the same categor and class of aircraft to be used.
3—three takeoffs and three landings, either full stop o touch–and–go, but must be accompanied by certificated flight instructor who meets the recen experience for night flight.
4—three takeoffs and three landings to a full stop in th same category but not necessarily in the same clas of aircraft to be used.

1515. To act as pilot in command of an aircraft, one must show by logbook endorsement the satisfactory (1) accomplishment of a flight review, or (2) completion of a pilot proficiency check within the preceding

1—6 mo.
2—12 mo.
3—24 mo.
4—36 mo.

1516. The takeoffs and landings required to meet recency of experience requirements for carrying passengers in a tailwheel airplane

1—may be touch-and-go in the same class airplane.
2—must be touch-and-go in any class airplane.
3—may be full stop in any class airplane.
4—must be full stop in the same class airplane.

1517. What experience requirements are needed to carry passengers?

1—Checkout by a flight instructor.
2—Three takeoffs and landings.
3—Proficiency check by a pilot examiner or an FAA inspector.
4—Application for a waiver.

1518. When a certificated pilot changes permanent mailing address and fails to notify the FAA Airmen Certification Branch of the new address, the pilot is entitled to exercise the privileges of the pilot certificate for a period of only

1—30 days after the date of the move.
2—60 days after the date of the move.
3—90 days after the date of the move.
4—120 days after the date of the move.

1519. One of the requirements to exercise the privileges of a private pilot certificate with a glider or lighter-than-air, free balloon rating is at least a

1—Third-Class Medical Certificate.
2—statement from any designated medical examiner.
3—statement by the pilot certifying that he/she has no known medical deficiency that would make him/her unable to act as pilot.
4—Second-Class Medical Certificate.

1520. In regard to general privileges and limitations, a private pilot may

1—not be paid in any manner for the operating expenses of a flight.
2—act as pilot in command of a glider carrying a passenger for compensation if the flight is in connection with a business or employment.
3—share the operating expenses of a glider flight with a passenger.
4—charge a reasonable fee for acting as pilot in command.

1521. To act as pilot in command, a flight review or proficiency check must have been satisfactorily completed within the preceding

1—12 mo.
2—18 mo.
3—24 mo.
4—36 mo.

1522. According to regulations pertaining to general privileges and limitations, a private pilot may

1—not be paid in any manner for the operating expenses of a flight.
2—be paid for the operating expenses of a flight if at least three takeoffs and three landings were made by the pilot within the preceding 90 days.
3—share the operating expenses of a flight with the passengers.
4—charge a reasonable fee for acting as pilot in command.

1523. What exception, if any, permits a private pilot to act as pilot in command of an aircraft carrying passengers who pay for the flight?

1—There is no exception.
2—If the passengers pay all the operating expenses only.
3—If a donation is made to a charitable organization for the flight.
4—If the pilot acts as second in command of an aircraft requiring more than one pilot.

1524. Unless otherwise specified, Federal airways extend from

1—1,200 ft. above the surface upward to 14,500 ft. MSL and are 16 NM wide.
2—700 ft. above the surface upward to the Continental Control Area and are 10 NM wide.
3—1,200 ft. above the surface upward to 18,000 ft. MSL and are 8 NM wide.
4—the surface upward to 18,000 ft. MSL and are 4 NM wide.

1525. Within the contiguous United States, a control zone extends from the surface upward to the base of

1—an airport traffic area.
2—the Continental Control Area.
3—a Transition Area.
4—a Terminal Control Area.

1526. If an in-flight emergency requires immediate action, a pilot in command may

1—deviate from FAR's to the extent required to meet the emergency, but must submit a written report to the Administrator within 24 hr.
2—not deviate from FAR's unless prior to the deviation approval is granted by the Administrator.
3—deviate from FAR's to the extent required to meet that emergency.
4—not deviate from FAR's unless permission is obtained from air traffic control.

1527. The person directly responsible for the pre-launch briefing of passengers for a balloon flight is the

1—crew chief.
2—safety officer.
3—pilot in command.
4—ground crewmember designated by the balloon commander.

1528. The final authority as to the operation of an aircraft is the

1—FAA.
2—pilot in command.
3—owner or operator of the aircraft.
4—inspector who performs the periodic check.

1529. Which preflight action is required for every flight?

1—Check weather reports and forecasts.
2—Determine runway length at airports of intended use.
3—Determine alternatives if the flight cannot be completed.
4—Check for any known traffic delays.

1530. Preflight action, as required by regulations for all flights away from the vicinity of an airport, shall include a study of the weather, taking into consideration fuel requirements and

1—an operational check of the navigation radios.
2—the designation of an alternate airport.
3—the filing of a flight plan.
4—an alternate course of action if the flight cannot be completed as planned.

1531. In addition to other preflight actions for a VFR flight away from the vicinity of the departure airport, regulations require the pilot in command to

1—file a flight plan.
2—check each fuel tank visually to ensure that it is full.
3—check the accuracy of the omninavigation equipment and the emergency locator transmitter.
4—determine runway lengths of airports of intended use and the airplane's takeoff and landing distance data.

1532. Prior to each flight, the pilot in command must

1—check the personal logbook for appropriate recent experience.
2—become familiar with all available information concerning that flight.
3—calculate the weight and balance of the aircraft to determine if the CG is within limits.
4—check with ATC for the latest traffic advisories and any possible delays.

1533. A person may not act as a crewmember of a civil aircraft if alcoholic beverages have been consumed by that person within the preceding

1—8 hr.
2—12 hr.
3—24 hr.
4—48 hr.

1534. Under what condition, if any, may a pilot allow a person who is obviously under the influence of intoxicating liquors or drugs to be carried aboard an aircraft?

1—Under no condition.
2—Only if the person is a medical patient under proper care or in an emergency.
3—Only if the person does not have access to the cockpit or pilot's compartment.
4—Only if a second pilot is aboard.

1535. Objects may be dropped from a balloon

1—only in an emergency.
2—if precautions are taken to avoid injury or damage to persons or property on the surface.
3—if prior permission is received from the FAA.
4—if passengers are not carried.

1536. Seatbelts in a glider are required by regulations to be properly secured about the occupants during

1—flight in moderate or severe turbulence.
2—the entire flight.
3—takeoffs and landings.
4—stall and spin practice.

1537. Regulations require that seatbelts in an airplane be properly secured about the

1—occupants during takeoffs and landings.
2—crewmembers only, during takeoffs and landings.
3—occupants during flight in moderate or severe turbulence only.
4—passengers and crewmembers during the entire flight.

1538. Seatbelts are required to be properly secured about which persons in a glider and when?

1—Pilot crewmembers only, during takeoffs and landings.
2—Occupants during takeoffs and landings.
3—Each person on board the glider during the entire flight.
4—Occupants during flight in moderate or severe turbulence only.

1539. What obligation does a pilot in command have concerning the use of seatbelts?

1—The pilot in command's seatbelt must be fastened during the entire flight.
2—The pilot in command must brief the passengers on the use of seatbelts and notify them to fasten the seatbelts during takeoff and landing.
3—The pilot in command must instruct the passengers to keep seatbelts fastened for the entire flight except for brief rest periods.
4—The pilot in command must instruct the passengers on the use of seatbelts, but does not have the authority to require their use, except during an emergency.

1540. When must each occupant of an aircraft wear an approved parachute?

1—When an aircraft is being tested after major repair.
2—When flying over water beyond gliding distance to the shore.
3—When a door is removed from the aircraft to facilitate parachute jumpers.
4—When an intentional bank that exceeds 60° is to be made.

1541. A chair–type parachute must have been packed by a certificated and appropriately rated parachute rigger within the preceding

1—30 days.
2—60 days.
3—90 days.
4—120 days.

1542. An approved chair–type parachute may be carried in a balloon for emergency use if it has been packed by an appropriately rated parachute rigger within the preceding

1—60 days.
2—90 days.
3—120 days.
4—6 mo.

1543. The minimum allowable strength of a towline used for an aerotow of a glider having a certificated gross weight of 700 lb. is

1—560 lb.
2—700 lb.
3—1,000 lb.
4—1,400 lb.

1544. The minimum allowable strength of a towline used for an aerotow of a glider having a certificated gross weight of 1,040 lb. is

1—502 lb.
2—832 lb.
3—1,040 lb.
4—2,080 lb.

1545. For the aerotow of a glider that weighs 700 lb., which of the following towrope tensile strengths would require the use of safety links at each end of the rope?

1—700 lb.
2—850 lb.
3—1,040 lb.
4—1,450 lb.

1546. No person may begin a VFR flight unless there is enough fuel aboard the rotorcraft to fly to the first point of intended landing and thereafter for at least

1—45 min.
2—30 min.
3—20 min.
4—10 min.

1547. When using a towline having a breaking strength more than twice the maximum certificated operating weight of the glider, an approved safety link must be installed at what point(s)?

1—Only the point where the towline is attached to the glider.
2—The point where the towline is attached to the glider and the point of attachment of the towline to the towplane.
3—Only the point where the towline is attached to the towplane.
4—At any point along the length of the towline.

1548. No person may begin a flight in a rotorcraft under VFR unless there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly thereafter for at least

1—1 hr.
2—20 min.
3—30 min.
4—45 min.

1549. What is the fuel requirement for flight under VFR at night?

1—Full fuel tanks.
2—Enough to complete the flight at normal cruising flight with adverse wind conditions.
3—Enough to fly to the first point of intended landing and to fly after that for 30 min. at normal cruising speed.
4—Enough to fly to the first point of intended landing and to fly after that for 45 min. at normal cruising speed.

1550. What is the fuel requirement for flight under VFR during daylight hours?

1—Full fuel tanks.
2—Enough to complete the flight at normal cruising flight with adverse wind conditions.
3—Enough to fly to the first point of intended landing and to fly after that for 30 min. at normal cruising speed.
4—Enough to fly to the first point of intended landing and to fly after that for 45 min. at normal cruising speed.

1551. Unless operating under the terms of a letter of agreement, a helicopter at or below 1,000 ft. AGL in a Group I Terminal Control Area must be equipped with at least

1—one operable ILS system.
2—an operable VOR or TACAN receiver.
3—instruments and equipment required for IFR operations.
4—an operable transponder having mode A 4096 code capability.

1552. An operable transponder is required in which airspaces?

1—Group I TCA's, ADIZ, and positive control areas.
2—Group I and Group II TCA's only.
3—High-density airport traffic areas and Group I TCA's.
4—Group I TCA's, Group II TCA's, and positive control areas.

1553. What documents or records must be aboard an aircraft during flight?

1—Operating limitations and an Aircraft Use and Inspection Report.
2—Operating limitations; a registration certificate; and an appropriate, current, and properly displayed airworthiness certificate.
3—Repair and alteration forms and a registration certificate.
4—Aircraft and engine logbooks and a registration certificate.

1554. No person may operate a civil aircraft unless the airworthiness certificate, or special flight permit or authorization required by regulations, is

1—on file in the owner's operation office where the aircraft is based.
2—filed with the other required certificates or documents within the aircraft to be flown.
3—displayed at the cabin or cockpit entrance so that it is legible to passengers or crewmembers.
4—included in the approved logbooks for the aircraft to be flown.

1555. Who is responsible for determining if an aircraft is in condition for safe flight?

1—A certificated aircraft mechanic.
2—A certificated aircraft maintenance inspector.
3—The pilot in command.
4—The owner or operator.

1556. An aircraft's operating limitations may be found

1—on the airworthiness certificate.
2—in the airplane flight manual, approved manual material, markings, and placards, or any combination thereof.
3—only in the FAA-approved airplane flight manual.
4—only in the owner's handbook published by the aircraft manufacturer.

1557. Unless each occupant is provided with supplemental oxygen, no person may operate a civil aircraft of U.S. registry above a cabin pressure altitude of

1—15,000 ft. MSL.
2—14,000 ft. MSL.
3—12,500 ft. MSL.
4—10,000 ft. MSL.

1558. Federal Aviation Regulations require that when operating an aircraft at cabin pressure altitudes above 12,500 ft. MSL up to and including 14,000 ft. MSL, supplemental oxygen shall be used during

1—the entire flight time at those altitudes.
2—that time in excess of 10 min. at those altitudes.
3—the entire climb phase at those altitudes, but is not required for the descent at those altitudes.
4—that time in excess of 30 min. at those altitudes.

1559. Which is normally prohibited when operating a restricted category civil aircraft?

1—Flight under instrument flight rules.
2—Flight over a densely populated area.
3—Flight within a control zone.
4—Flight within the Continental Control Area.

1560. When are non-rechargeable batteries of an ELT (emergency locator transmitter) required to be replaced?

1—Every 24 mo.
2—When 50 percent of their useful life expires or they were in use for a cumulative period of 1 hr.
3—At the time of each 100-hour or annual inspection.
4—Annually.

1561. An airplane and an airship are converging. If the airship is left of the airplane's position, which aircraft has the right-of-way?

1—The pilot of the airplane should give way; the airship is to the left.
2—The airship has the right-of-way.
3—Each pilot should alter course to the right.
4—The airplane has the right-of-way; it is more maneuverable.

1562. When two or more airplanes are approaching an airport for the purpose of landing, the right-of-way belongs to the airplane

1—that has the other to its right.
2—that is the least maneuverable.
3—that is either ahead of or to the other's right regardless of altitude.
4—at the lower altitude, but it shall not take advantage of this rule to cut in front of or to overtake another.

1563. What action is required when two aircraft converge at the same altitude, but not head-on?

1—The more maneuverable aircraft shall give way.
2—The faster aircraft shall give way.
3—The aircraft on the left shall give way.
4—Each aircraft shall give way to the right.

1564. What action should be taken, if during a night flight, a pilot observes a steady green light and a flashing red light on another aircraft at the same altitude?

1—Exercise extreme caution, the other aircraft is in distress.
2—Give way to the right, the other aircraft is approaching head-on.
3—Be alert, the other aircraft should give way.
4—Give way to the left, the other aircraft is passing to the right.

1565. What action should be taken if a glider and an airplane approach each other at the same altitude and on a head-on collision course?

1—The airplane should give way because the glider has the right-of-way.
2—The airplane should give way because it is more maneuverable.
3—Both should give way to the right.
4—The airplane should climb and the glider should descend so as to pass each other by at least 500 ft.

1566. Which aircraft has the right-of-way over all other air traffic?

1—A balloon.
2—An aircraft in distress.
3—An aircraft on final approach to land.
4—An aircraft towing or refueling another aircraft.

1567. Which aircraft has the right-of-way over all other aircraft?

1—Balloon.
2—Airship.
3—Experimental aircraft.
4—Restricted aircraft.

1568. When flying beneath the lateral limits of a Terminal Control Area, the maximum speed authorized is

1—250 kts.
2—200 kts.
3—180 kts.
4—156 kts.

1569. Unless otherwise authorized or required by air traffic control, what is the maximum indicated airspeed at which a person may operate an aircraft below 10,000 ft. MSL?

1—156 kts.
2—180 kts.
3—200 kts.
4—250 kts.

1570. Unless otherwise authorized or required by air traffic control, the maximum indicated airspeed at which a reciprocating engine equipped aircraft should be flown within an airport traffic area is

1—156 kts.
2—180 kts.
3—200 kts.
4—288 kts.

1571. In which controlled airspace is acrobatic flight prohibited?

1—All controlled airspace.
2—Control zones and Federal airways.
3—Control zones, Federal airways, and control areas.
4—Control zones, Federal airways, control areas, and traffic control areas.

1572. According to regulations, no person may operate an aircraft in acrobatic flight

1—over any congested area of a city, town, or settlement.
2—within 5 mi. of a Federal airway.
3—below an altitude of 2,000 ft. above the surface.
4—when flight visibility is less than 5 mi.

1573. No person may operate an aircraft in acrobatic flight when the flight visibility is less than

1—3 mi.
2—5 mi.
3—7 mi.
4—10 mi.

1574. What is the lowest altitude permitted for acrobatic flight?

1—1,000 ft. AGL.
2—1,500 ft. AGL.
3—1,000 ft. above the highest obstacle within 5 mi.
4—1,500 ft. above the highest obstacle within 5 mi.

1575. When an aircraft is being operated at night, it must display lighted position lights during the period from

1—1 hr. before sunset to 1 hr. after sunrise.
2—30 min. after sunset to 30 min. after sunrise.
3—30 min. before sunset to 30 min. after sunrise.
4—sunset to sunrise.

1576. During what time period should lighted position lights be displayed on an aircraft?

1—30 min. before sunset to 30 min. after sunrise.
2—1 hr. before sunset to 1 hr. after sunrise.
3—1 hr. before sunset to 1 hr. before sunrise.
4—sunset to sunrise.

1577. What action should be taken if a pilot receives a clearance that will cause a deviation from a rule?

1—Accept the clearance, because the pilot is not responsible for the deviation.
2—Accept the clearance and advise air traffic control when deviation occurs.
3—Refuse the clearance as stated and request that it be amended.
4—Accept the clearance and advise air traffic control that you believe a rule deviation will occur.

1578. When may air traffic control request a detailed report of an emergency even though a rule has not been violated?

1—When priority has been given.
2—Anytime an emergency occurs.
3—When the emergency occurs in controlled airspace.
4—Only when an accident results from the emergency.

1579. What action, if any, is appropriate if the pilot deviates from an air traffic control instruction during an emergency and is given priority?

1—Take no special action since you are pilot in command.
2—If requested, file a detailed report within 48 hr. to the chief of the air traffic control facility.
3—File a report to the FAA Administrator within 48 hr.
4—File a report to the chief of that air traffic control facility within 24 hr.

1580. An air traffic control clearance provides

1—authorization for flight in uncontrolled airspace.
2—priority over all other traffic.
3—adequate separation from all traffic.
4—authorization to proceed under specified traffic conditions in controlled airspace.

1581. What is the difference between a steady red and a flashing red light signal from the tower to an aircraft approaching to land?

1—Both light signals mean the same except the flashing red light requires a more urgent reaction.
2—A steady red light signals to continue circling and a flashing red light signals that the airport is unsafe for landing.
3—A steady red light signals to continue circling and a flashing red light signals to continue, but exercise extreme caution.
4—A steady red light signals that the airport is unsafe and a flashing red light signals to use a different runway.

1582. An alternating red and green light signal directed from the control tower to your aircraft in flight is a signal to

1—hold your position.
2—exercise extreme caution.
3—not land; the airport is unsafe.
4—return to the airport immediately.

1583. A flashing green air traffic control signal directed to an aircraft on the surface is a signal that the pilot

1—is cleared to taxi.
2—should exercise extreme caution.
3—should taxi clear of the runway in use.
4—should stop taxiing.

1584. While on the final approach for landing, an alternating green and red light followed by a flashing red light is received from the control tower. Under these circumstances the pilot should

1—land and clear the runway in use as safely and quickly as possible.
2—discontinue the approach, fly the same traffic pattern and approach again, and land.
3—abandon the approach, realizing the airport is unsafe for landing.
4—abandon the approach, circle the airport to the right, and expect a flashing white light when the airport is safe for landing.

1585. A steady green air traffic control light signal directed to an aircraft in flight is a signal that the pilot

1—is cleared to land.
2—should give way to other aircraft and continue circling.
3—should return for landing.
4—should exercise extreme caution.

1586. A flashing white light signal from the control tower to an aircraft taxiing is an indication

1—to taxi at a faster speed.
2—to taxi only on taxiways and not cross runways.
3—to return to the starting point on the airport.
4—that instrument conditions exist.

1587. Except when necessary for takeoff or landing, an aircraft may not be operated closer than what distance from any person, vehicle, or structure?

1—2,000 ft.
2—1,500 ft.
3—1,000 ft.
4—500 ft.

1588. Except when necessary for takeoff or landing, what is the minimum safe altitude for a pilot to operate an aircraft anywhere?

1—An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
2—An altitude of 500 ft. above the surface and no closer than 500 ft. to any person, vessel, vehicle, or structure.
3—An altitude of 500 ft. above the highest obstacle within a horizontal radius of 1,000 ft.
4—An altitude of 1,000 ft. above the highest obstacle within a horizontal radius of 2,000 ft.

1589. Except when necessary for takeoff or landing, what is the minimum safe altitude required for a pilot to operate an aircraft over congested areas?

1—An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
2—An altitude of 500 ft. above the surface and no closer than 500 ft. to any person, vessel, vehicle, or structure.
3—An altitude of 500 ft. above the highest obstacle within a horizontal radius of 1,000 ft.
4—An altitude of 1,000 ft. above the highest obstacle within a horizontal radius of 2,000 ft.

1590. Except when necessary for takeoff or landing, what is the minimum safe altitude for a pilot to operate an airplane over other than a congested area?

1—An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
2—An altitude of 500 ft. AGL except over open water or a sparsely populated area which requires 500 ft. from any person, vessel, vehicle, or structure.
3—An altitude of 500 ft. above the highest obstacle within a horizontal radius of 1,000 ft.
4—An altitude of 1,000 ft. above the highest obstacle within a horizontal radius of 2,000 ft.

1591. If an altimeter setting is not available before flight, to which altitude or setting should the pilot adjust the altimeter?

1—To 29.92" Hg for flight below 18,000 ft. MSL.
2—The elevation of the nearest airport corrected to mean sea level.
3—The elevation of the departure area.
4—Pressure altitude corrected for nonstandard temperature.

1592. When is it first required that the altimeter be set to 29.92" Hg. when climbing to cruising altitude or flight level?

1—12,500 ft. MSL.
2—14,500 ft. MSL.
3—18,000 ft. MSL.
4—24,000 ft. MSL.

1593. Prior to takeoff, the altimeter should be set to

1—the current local altimeter setting, if available, or the departure airport elevation.
2—the corrected density altitude of the departure airport.
3—the corrected pressure altitude for the departure airport.
4—29.92" Hg.

1594. What is the purpose of an airport traffic area?

1—To provide for the control of aircraft landing and taking off from an airport with an operating control tower.
2—To provide for the control of all aircraft operating in the vicinity of an airport with an operating control tower.
3—To provide for the control of air traffic within a control zone that has an operating control tower.
4—To restrict aircraft without radios from operating in the vicinity of an airport with an operating control tower.

1595. Unless otherwise authorized, two-way radio communications with air traffic control are required for landings or takeoffs

1—within control zones regardless of the weather conditions.
2—at all tower controlled airports regardless of the weather conditions.
3—at all tower controlled airports only when weather conditions are less than VFR.
4—at tower controlled airports within control zones only when weather conditions are less than VFR.

1596. When is an airport traffic area in effect?

1—From 1 hr. before sunrise to 1 hr. after sunset.
2—When the associated control tower is in operation.
3—When the associated FSS is in operation.
4—From sunrise to sunset.

1597. When approaching an airport for landing in a helicopter,

1—remain below the airplane traffic pattern altitude.
2—avoid the flow of fixed-wing traffic.
3—fly right-hand traffic.
4—make all turns to the left.

1598. Which is the correct traffic pattern departure procedure to use at a noncontrolled airport?

1—Depart in any direction consistent with safety, after crossing the airport boundary.
2—Make all turns to the left.
3—Comply with any FAA traffic pattern established for the airport.
4—Depart as prearranged with other pilots using the airport.

1599. Regardless of weather conditions, air traffic control authorization is required prior to operating an aircraft within a

1—control zone.
2—Terminal Radar Service Area.
3—Terminal Control Area.
4—Transition Area.

1600. Which equipment is required when operating an aircraft within a Group II Terminal Control Area?

1—A 4096 code transponder.
2—A 4096 code transponder with mode C capability.
3—A VOR receiver with distance measuring equipment.
4—An automatic direction finder.

1601. What minimum pilot certification is required for takeoff or landing operations in a Group I Terminal Control Area?

1—Student pilot certificate with appropriate logbook endorsements.
2—Private pilot certificate.
3—Private pilot certificate with an instrument rating.
4—Commercial pilot certificate.

1602. In which type of airspace are VFR flights prohibited?

1—Terminal Control Area.
2—Continental Control Area.
3—Control zone.
4—Positive control area.

1603. The minimum flight visibility required for VFR flights above 10,000 ft. MSL and more than 1,200 ft. AGL is

1—1 SM.
2—3 SM.
3—5 SM.
4—not specified by regulation.

1604. During operations outside controlled airspace at altitudes of more than 1,200 ft. AGL, but less than 10,000 ft. MSL, the minimum horizontal distance from clouds requirement for VFR flight is

1—500 ft.
2—1,000 ft.
3—1,500 ft.
4—2,000 ft.

1605. VFR flight above 1,200 ft. AGL and below 10,000 ft. MSL requires a minimum visibility and vertical cloud clearance of

1—3 mi., and 500 ft. below or 1,000 ft. above the clouds in controlled airspace.
2—5 mi., and 1,000 ft. below or 1,000 ft. above the clouds at all altitudes.
3—5 mi., and 1,000 ft. below or 1,000 ft. above the clouds only in the Continental Control Area.
4—3 mi., and 1,000 ft. below or 2,000 ft. above the clouds at all altitudes within and outside of controlled airspace.

1606. For VFR flight operations above 10,000 ft. MSL and more than 1,200 ft. AGL, the minimum horizontal distance from clouds required is

1—1,000 ft.
2—2,000 ft.
3—1 mi.
4—5 mi.

1607. The basic VFR weather minimums for operating an aircraft beneath the ceiling within a control zone are

1—500-foot ceiling and 1 mi. visibility.
2—1,000-foot ceiling and 3 mi. visibility.
3—clear of clouds and 2 mi. visibility.
4—2,000-foot ceiling and 1 mi. visibility.

1608. The minimum distance from clouds required for VFR operations on an airway below 10,000 ft. is

1—remain clear of clouds.
2—500 ft. below, 1,000 ft. above, and 2,000 ft. horizontally.
3—500 ft. above, 1,000 ft. below, and 2,000 ft. horizontally.
4—1,000 ft. above, 1,000 ft. below, and 1 mi. horizontally.

1609. What minimum flight visibility is required for VFR flight operations on an airway below 10,000 ft.?

1—1 mi.
2—3 mi.
3—4 mi.
4—5 mi.

1610. What minimum visibility and clearance from clouds are required for VFR operations in uncontrolled airspace at 1,200 ft. AGL or below during daylight hours?

1—1 mi. visibility and clear of clouds.
2—3 mi. visibility and clear of clouds.
3—1 mi. visibility, 500 ft. below, 1,000 ft. above, and 2,000 ft. horizontal clearance from clouds.
4—3 mi. visibility, 500 ft. above, 1,000 ft. below, and 2,000 ft. horizontal clearance from clouds.

1611. During operations within controlled airspace at altitudes of more than 1,200 ft. AGL, but less than 10,000 ft. MSL, the minimum distance above clouds requirement for VFR flight is

1—500 ft.
2—1,000 ft.
3—1,500 ft.
4—2,000 ft.

1612. During operations at altitudes of more than 1,200 ft. AGL and at or above 10,000 ft. MSL, the minimum distance above clouds requirement for VFR flight is

1—500 ft.
2—1,000 ft.
3—1,500 ft.
4—2,000 ft.

1613. Outside controlled airspace, the minimum flight visibility requirement for VFR flight above 1,200 ft. AGL and below 10,000 ft. MSL during daylight hours is

1—1 mi.
2—3 mi.
3—5 mi.
4—7 mi.

1614. During operations outside controlled airspace at altitudes of more than 1,200 ft. AGL, but less than 10,000 ft. MSL, the minimum distance below clouds requirement for VFR flight is

1—500 ft.
2—1,000 ft.
3—1,500 ft.
4—2,000 ft.

1615. During operations within controlled airspace at altitudes of less than 1,200 ft. AGL, the minimum horizontal distance from clouds requirement for VFR flight is

1—500 ft.
2—1,000 ft.
3—1,500 ft.
4—2,000 ft.

1616. Except for a helicopter, a special VFR clearance authorizes the pilot of an aircraft to operate VFR while within a control zone

1—when the ceiling is less than 1,000 ft. and visibility less than 1 mi. if the aircraft does not exceed maneuvering speed.
2—if clear of clouds and the visibility is at least 1 mi.
3—with no minimum visibility requirements if clear of the clouds.
4—at or below cloud base with a flight visibility of 1 mi. or less, provided the aircraft remains below 1,000 ft. above the surface.

1617. No person may operate an airplane within a control zone at night under special VFR unless

1—the flight can be conducted 500 ft. below the clouds.
2—an instructor is aboard.
3—the airplane is equipped for instrument flight.
4—the flight visibility is at least 3 mi.

1618. What are the minimum requirements for airplane operations under special VFR in a control zone at night?

1—The minimum visibility is 3 mi. and the airplane must operate clear of clouds.
2—The airplane must be under radar surveillance at all times while in the control zone.
3—The airplane must be equipped for IFR and with an altitude reporting transponder.
4—The pilot must be instrument rated and the airplane must be IFR equipped.

1619. What is the minimum weather condition required for airplanes operating under special VFR in a control zone?

1—1 mi. flight visibility.
2—1 mi. flight visibility and 1,000-foot ceiling.
3—3 mi. flight visibility and 1,000-foot ceiling.
4—3 mi. flight visibility.

1620. May a private pilot operate a helicopter under special VFR within a control zone at night?

1—Yes; regulations permit this.
2—No; the helicopter must be instrument equipped and the pilot must be instrument rated.
3—Yes; if the flight visibility is at least 1 SM.
4—No; a special VFR clearance is only issued to transport category aircraft between sunset and sunrise.

1621. Which VFR cruising altitude is acceptable for a flight on a Victor airway with a magnetic course of 175°? The terrain is less than 1,000 ft.

1—4,000 ft.
2—4,500 ft.
3—5,000 ft.
4—5,500 ft.

1622. Which VFR cruising altitude is acceptable for a flight on a Victor airway with a magnetic course of 185°? The terrain is less than 1,000 ft.

1—4,000 ft.
2—4,500 ft.
3—5,000 ft.
4—5,500 ft.

1623. Each person operating an aircraft under VFR in level cruising flight at an altitude of more than 3,000 ft. above the surface, and below 18,000 ft. MSL, shall maintain an odd-thousand plus 500-foot altitude while on a

1—magnetic heading of 180° through 359°.
2—magnetic course of 0° through 179°.
3—true course of 180° through 359°.
4—true heading of 0° through 179°.

1624. The responsibility for ensuring that an aircraft is maintained in an airworthy condition is primarily that of the

1—pilot in command of the aircraft.
2—owner or operator of the aircraft.
3—maintenance shop.
4—certified mechanic who signs the aircraft maintenance records.

1625. An airworthiness certificate remains valid

1—until ownership is transferred.
2—provided the aircraft has not had major damage.
3—until surrendered, suspended, or revoked.
4—provided the aircraft is maintained and operated according to FAR's.

1626. If an alteration or repair substantially affects an aircraft's operation in flight, that aircraft must be test flown by an appropriately-rated pilot and approved for return to service prior to being operated

1—by any private pilot.
2—with passengers aboard.
3—for compensation or hire.
4—away from the vicinity of the airport.

1627. Before passengers can be carried in an aircraft that has been altered in a manner that may have appreciably changed its flight characteristics, it must be flight tested by an appropriately-rated pilot with at least a

1—commercial pilot certificate and an instrument rating.
2—private pilot certificate.
3—commercial pilot certificate and a mechanic's certificate.
4—commercial pilot certificate.

1628. Completion of an annual inspection and the return of the aircraft to service should always be indicated by

1—the relicensing date on the registration certificate.
2—an appropriate notation in the aircraft maintenance records.
3—an inspection sticker placed on the instrument panel that lists the annual inspection completion date.
4—the issuance date of the airworthiness certificate.

1629. An aircraft's last annual inspection was performed on July 12, this year. The next annual inspection will be due no later than

1—July 31, next year.
2—July 13, next year.
3—100 flight hours following the last annual inspection.
4—12 calendar months after the date shown on the airworthiness certificate.

1630. To determine the expiration date of the last annual aircraft inspection, a person should refer to the

1—airworthiness certificate.
2—registration certificate.
3—aircraft maintenance records.
4—owner/operator manual.

1631. How long does the airworthiness certificate of an aircraft remain valid?

1—As long as the aircraft has a current registration certificate.
2—Indefinitely, unless the aircraft suffers major damage.
3—As long as the aircraft is maintained and operated as required by FAR's.
4—Indefinitely, unless the prescribed operating limitations are exceeded.

1632. Which record or documents shall the owner or operator of an aircraft keep to show compliance with an applicable Airworthiness Directive?

1—The aircraft maintenance records.
2—Airworthiness certificate and owner's handbook.
3—Airworthiness and registration certificates.
4—Aircraft flight manual and owner's handbook.

1633. What feature is associated with a temperature inversion?

1—A stable layer of air.
2—An unstable layer of air.
3—Chinook winds on mountain slopes.
4—Air mass thunderstorms.

1634. The most frequent type of ground or surface based temperature inversion is that produced by

1—terrestrial radiation on a clear, relative still night.
2—warm air being lifted rapidly aloft in the vicinity of mountainous terrain.
3—the movement of colder air under warm air, or the movement of warm air over cold air.
4—widespread sinking of air within a thick layer aloft resulting in heating by compression.

1635. A temperature inversion would most likely result in which of the following weather conditions?

1—Clouds with extensive vertical development above an inversion aloft.
2—Good visibility in the lower levels of the atmosphere and poor visibility above an inversion aloft.
3—An increase in temperature as altitude is increased.
4—A decrease in temperature as altitude is increased.

1636. Which weather conditions should be expected beneath a low-level temperature inversion layer when the relative humidity is high?

1—Smooth air and poor visibility due to fog, haze, or low clouds.
2—Light wind shear and poor visibility due to haze and light rain.
3—Turbulent air and poor visibility due to fog, low stratus type clouds, and showery precipitation.
4—Updrafts and turbulence due to surface heating, fair visibility, and cumulus clouds developing at the top of the inversion.

1637. Every physical process of weather is accompanied by, or is the result of,

1—the movement of air.
2—a pressure differential.
3—a heat exchange.
4—moisture.

1638. What causes variations in altimeter settings between weather reporting points?

1—Unequal heating of the Earth's surface.
2—Variation of terrain elevation creating barriers to the movement of an air mass.
3—Coriolis force reacting with friction.
4—Friction of the air with the Earth's surface.

1639. What are the standard temperature and pressure values for sea level?

1—15° C and 29.92" Hg.
2—59° C and 1013.2 millibars.
3—59° F and 29.92 millibars.
4—15° C and 1013.2" Hg.

1640. Winds at 5,000 ft. AGL on a particular flight are southwesterly while most of the surface winds are southerly. This difference in direction is primarily due to

1—a stronger pressure gradient at higher altitudes.
2—friction between the wind and the surface.
3—stronger Coriolis force at the surface.
4—the influence of pressure systems at the lower altitudes.

1641. What condition does a rising barometer indicate for balloon operations?

1—Increasing thermal activity and clouds.
2—Decreasing clouds and winds.
3—Chances of thunderstorms.
4—Approaching frontal activity.

1642. If the temperature/dew point spread is small and decreasing, and the temperature is 62° F, what type weather is most likely to develop?

1—Freezing precipitation.
2—Thunderstorms.
3—Fog or low clouds.
4—Rain showers.

1643. What is meant by the term dew point?

1—The temperature at which condensation and evaporation are equal.
2—The temperature at which dew will always form.
3—The temperature to which air must be cooled to become saturated.
4—The spread between actual temperature and the temperature during evaporation.

1644. The amount of water vapor which air can hold largely depends on

1—the dew point.
2—air temperature.
3—stability of air.
4—relative humidity.

1645. What are the processes by which moisture is added to unsaturated air?

1—Heating and sublimation.
2—Evaporation and sublimation.
3—Heating and condensation.
4—Supersaturation and evaporation.

1646. The presence of ice pellets at the surface is evidence that

1—there are thunderstorms in the area.
2—a cold front has passed.
3—there is freezing rain at a higher altitude.
4—the pilot can climb to a higher altitude without encountering more than light icing.

1647. Clouds, fog, or dew will always form when

1—water vapor condenses.
2—water vapor is present.
3—relative humidity reaches or exceeds 100 percent.
4—the temperature and dew point are equal.

1648. Which of the following measurements can be used to determine the stability of the atmosphere?

1—Atmospheric pressure.
2—Actual lapse rate.
3—Surface temperature.
4—Wind velocity.

1649. Which of the following would decrease the stability of an air mass?

1—Warming from below.
2—Cooling from below.
3—Decrease in water vapor.
4—Sinking of the air mass.

1650. The conditions necessary for the formation of cumulonimbus clouds are a lifting action and

1—unstable air containing an excess of condensation nuclei.
2—unstable, moist air.
3—either stable or unstable air.
4—stable, moist air.

1651. What is a characteristic of stable air?

1—Stratiform clouds.
2—Unlimited visibility.
3—Fair weather cumulus clouds.
4—Temperature decreases rapidly with altitude.

1652. Moist, stable air flowing upslope can be expected to

1—produce stratus type clouds.
2—produce a temperature inversion.
3—cause showers and thunderstorms.
4—develop convective turbulence.

1653. If an unstable air mass is forced upward, what type clouds can be expected?

1—Layer-like clouds with a temperature inversion.
2—Layer-like clouds with little vertical development.
3—Layer-like clouds with considerable associated turbulence.
4—Clouds with considerable vertical development and associated turbulence.

1654. What is the approximate base of the cumulus clouds if the temperature at 1,000 ft. MSL is 70° F and the dew point is 48° F?

1—3,000 ft. MSL.
2—4,000 ft. MSL.
3—6,000 ft. MSL.
4—8,000 ft. MSL.

1655. At approximately what altitude above the surface would the pilot expect the base of cumuliform clouds if the surface air temperature is 82° F and the dew point is 51° F?

1—5,000 ft. MSL.
2—6,000 ft. MSL.
3—7,000 ft. MSL.
4—9,000 ft. MSL.

1656. What early morning weather observations indicate the possibility of good balloon conditions most of the day?

1—Clear skies and surface winds, 5 kts. or less.
2—Low moving, scattered cumulus clouds and surface winds, 5 kts. or less.
3—Overcast with stratus clouds and surface winds, 7 kts. or less.
4—Cumulus clouds and surface winds, light and variable.

1657. The suffix nimbus, used in naming clouds, means

1—a cloud with extensive vertical development.
2—a rain cloud.
3—a middle cloud containing ice pellets.
4—an accumulation of clouds.

1658. An almond or lens-shaped cloud which appears stationary, but which may contain winds of 50 kts. or more, is referred to as

1—an inactive frontal cloud.
2—a funnel cloud.
3—a lenticular cloud.
4—a stratus cloud.

1659. Clouds are divided into four families according to their

1—origin.
2—outward shape.
3—height range.
4—composition.

1660. Which clouds have the greatest turbulence?

1—Towering cumulus.
2—Cumulonimbus.
3—Nimbostratus.
4—Altocumulus castellanus.

1661. Which of the following cloud types would indicate convective turbulence?

1—Altocumulus standing lenticular clouds.
2—Nimbostratus clouds.
3—Towering cumulus clouds.
4—Cirrus clouds.

1662. A moist, unstable air mass is characterized by

1—cumuliform clouds and showery precipitation.
2—poor visibility and smooth air.
3—stratiform clouds and continuous precipitation.
4—fog and drizzle.

1663. What hazards are forecast in the Area Forecast (Figure 45) for Tennessee (TN), Alabama (AL), and the coastal waters?

1—Ceilings 3,000 to 5,000 ft. and visibilities 3 to 5 mi. in fog.
2—Thunderstorms with severe or greater turbulence, severe icing, and low level wind shear.
3—Moderate rime icing above the freezing level to 10,000 ft.
4—Moderate turbulence from 25,000 to 38,000 ft. due to the jetstream.

1664. What type obstructions to vision, if any, are forecast for the entire area from 2300Z until 0500Z the next day? (See Figure 45.)

1—None of any significance, VFR is forecast.
2—Ceilings 3,000 to 5,000 ft. broken, visibility 3 to 5 mi. in fog.
3—Ceilings 8,000 ft. scattered to clear except visibility below 3 mi. in fog over south-central Texas.
4—Generally ceilings 3,000 to 8,000 ft. to clear with visibilities sometimes below 3 mi. in fog.

1665. What type obstructions to vision, if any, are forecast for all the area except TN from 1040Z until 2300Z? (See Figure 45.)

1—None of any significance, VFR is forecast.
2—Ceilings 3,000 to 5,000 ft. broken, visibility 3 to 5 mi. in fog.
3—Ceilings 8,000 ft. scattered to clear except visibility below 3 mi. in fog until 15Z over south-central Texas.
4—Generally ceilings 3,000 to 8,000 ft. to clear with visibilities sometimes below 3 mi. in fog.

```
DFWH FA 041040
HAZARDS VALID UNTIL 042300
OK TX AR LA TN MS AL AND CSTL WTRS
FLT PRCTNS...TURBC...TN AL AND CSTL WTRS
          ...ICG...TN
          ...IFR...TX
TSTMS IMPLY PSBL SVR OR GTR TURBC SVR ICG AND LLWS
NON MSL HGTS NOTED BY AGL OR CIG
THIS FA ISSUANCE INCORPORATES THE FOLLOWING AIRMETS STILL IN
EFFECT...NONE.

DFWS FA 041040
SYNOPSIS VALID UNTIL 050500
AT 11Z RDG OF HI PRES ERN TX NWWD TO CNTRL CO WITH HI CNTR
OVR ERN TX. BY 05Z HI CNTR MOVS TO CNTRL LA.

DFWI FA 041040
ICING AND FRZLVL VALID UNTIL 042300
TN
FROM SLK TO HAT TO MEM TO ORD TO SLK
OCNL MDT RIME ICGIC ABV FRZLVL TO 100. CONDS ENDING BY 17Z.
FRZLVL 80 CHA SGF LINE SLPG TO 120 S OF A IAH MAF LINE.

DFWT FA 041040
TURBC VALID UNTIL 042300
TN AL AND CSTL WTRS
FROM SLK TO FLO TO 90S MOB TO MEI TO BUF TO SLK
OCNL MDT TURBC 250-380 DUE TO JTSTR. CONDS MOVG SLOLY EWD
AND CONTG BYD 23Z.

DFWC FA 041040
SGFNT CLOUD AND WX VALID UNTIL 042300...OTLK 042300-050500
IFR...TX
FROM SAT TO PSX TO BRO TO DRT TO SAT
VSBY BLO 3F TIL 15Z.
OK AR TX LA MS AL AND CSTL WTRS
80 SCT TO CLR EXCP VSBY BLO 3F TIL 15Z OVR PTNS S CNTRL TX.
OTLK...VFR.
TN
CIGS 30-50 BKN 100 VSBYS OCNLY 3-5F BCMG AGL 40-50 SCT TO
CLR BY 19Z. OTLK...VFR.
```

Figure 45

1666. What are characteristics of unstable air?

1—Turbulence and good surface visibility.
2—Turbulence and poor surface visibility.
3—Nimbostratus clouds and good surface visibility.
4—Nimbostratus clouds and poor surface visibility.

1667. A stable air mass is most likely to have which of the following characteristics?

1—Showery precipitation.
2—Turbulent air.
3—Smooth air.
4—Cumuliform clouds.

1668. What wind is forecast for St. Louis (STL) at 18,000 ft.? (See Figure 46.)

1—030° at 56 kts.
2—235° at 06 kts.
3—230° at 56 kts.
4—235° at 06 gusting to 16 kts.

1669. Determine the wind and temperature aloft forecast for Denver (DEN) at 30,000 ft. (See Figure 46.)

1—023° at 53 kts., temperature 47° C.
2—230° at 53 kts., temperature −47° C.
3—235° at 34 kts., temperature −7° C.
4—235° at 34 kts., temperature −47° F.

1670. Interpret the wind and temperature aloft forecast for 3,000 ft. at Kansas City (MKC). (See Figure 46.)

1—050° at 7 kts., temperature missing.
2—360° at 5 kts., temperature −7° C.
3—360° at 50 kts., temperature +7° C.
4—005° at 7 kts., temperature missing.

1671. Of what value is the depiction chart in Figure 47 to the pilot?

1—To determine general weather conditions on which to base flight planning.
2—For a forecast of cloud coverage, visibilities, and frontal activity.
3—To determine the frontal trends and air mass characteristics.
4—For an overall view of thunderstorm activity and forecast cloud heights.

1672. The marginal weather in southeast New Mexico as depicted in Figure 47 is due to

1—reported thunderstorms.
2—600-foot overcast ceilings.
3—rain showers.
4—low visibility.

1673. What weather phenomena is causing IFR conditions along the coast of Oregon and California? (See Figure 47.)

1—Squall line activity.
2—Low ceilings.
3—Heavy rain showers.
4—Drizzle.

1674. What is the status of the front that extends from New Mexico to Indiana as depicted in Figure 47?

1—Stationary.
2—Occluded.
3—Retreating.
4—Dissipating.

1675. According to the depiction chart in Figure 47, the current weather for a flight from central Arkansas to southeast Alabama is

1—broken clouds at 2,500 ft.
2—visibility from 3 to 5 mi.
3—broken to scattered clouds at 25,000 ft.
4—fog and low ceilings to move in from the gulf.

```
FD WBC 151745
BASED ON 151200Z DATA
VALID 1600Z FOR USE 1800-0300Z.  TEMPS NEG ABV 24000
FT    3000  6000     9000     12000    18000    21000    30000  34000  39000
ALS                  2420     2635-08  2535-18  2441-30  245945 246755 246862
AMA         2714     2725+00  2625-04  2531-15  2542-27  265842 256352 256762
DEN                  2321-04  2532-08  2434-19  2441-31  235347 236056 236262
HLC         1707-01  2113-03  2219-07  2330-17  2435-30  244145 244854 245561
MKC   0507  2006+03  2215-01  2322-06  2338-17  2348-29  236143 237252 238160
STL   2113  2325+07  2332+02  2339-01  2356-16  2373-27  239440 730649 731960
```

Figure 46

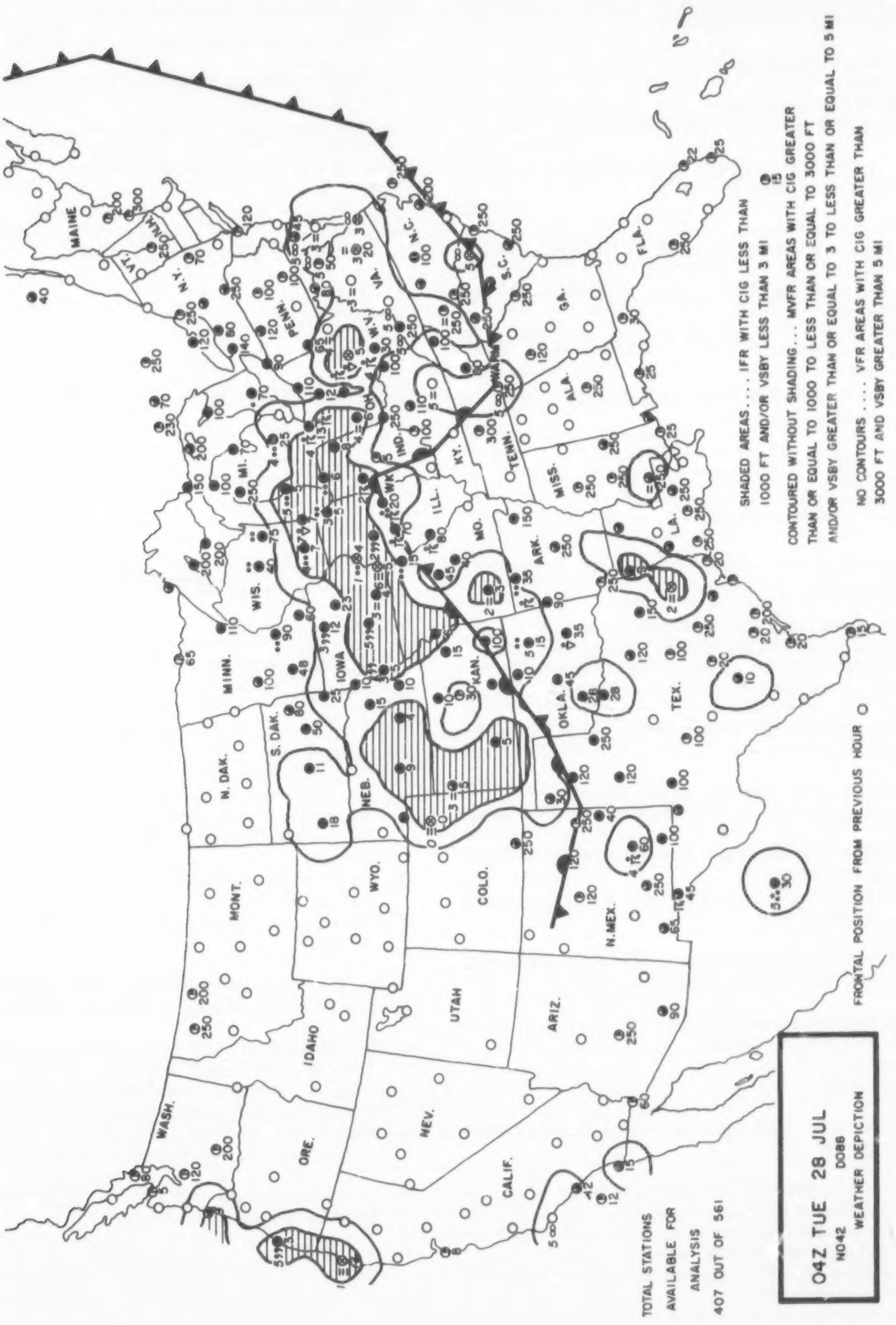

SHADED AREAS..... IFR WITH CIG LESS THAN
1000 FT AND/OR VSBY LESS THAN 3 MI
CONTOURED WITHOUT SHADING.... MVFR AREAS WITH CIG GREATER
THAN OR EQUAL TO 1000 TO LESS THAN OR EQUAL TO 3000 FT
AND/OR VSBY GREATER THAN OR EQUAL TO 3 TO LESS THAN OR EQUAL TO 5 MI
NO CONTOURS ..... VFR AREAS WITH CIG GREATER THAN
3000 FT AND VSBY GREATER THAN 5 MI
FRONTAL POSITION FROM PREVIOUS HOUR
04Z TUE 28 JUL
N042
D088
WEATHER DEPICTION
TOTAL STATIONS
AVAILABLE FOR
ANALYSIS
407 OUT OF 561
WASH.
ORE.
CALIF.
IDAHO
NEV.
MONT.
WYO.
UTAH
ARIZ.
COLO.
N. MEX.
N. DAK.
S. DAK.
NEB.
KAN.
OKLA.
TEX.
MINN.
IOWA
MO.
ARK.
LA.
WIS.
ILL.
MISS.
MI.
IND.
KY.
TENN.
ALA.
GA.
FLA.
S.C.
N.C.
VA.
W.V.
PENN.
N.Y.
VT.
MAINE

Figure 47

1676. An unstable air mass is most likely to have which of the following characteristics?

1—Stratiform clouds and fog.
2—Turbulent air.
3—Continuous precipitation.
4—Fair to poor visibility in haze and smoke.

1677. One weather phenomenon which will always occur when flying across a front is

1—a change in the wind.
2—a large precipitation area, if the frontal surface is steep.
3—a large temperature change, especially at high altitudes.
4—the presence of clouds, either ahead of or behind the front.

1678. The boundary between two different air masses is referred to as a

1—foehn gap.
2—frontolysis.
3—frontogenesis.
4—front.

1679. Steady precipitation, in contrast to showery, preceding a front is an indication of

1—cumuliform clouds with moderate turbulence.
2—stratiform clouds with moderate turbulence.
3—cumuliform clouds with little or no turbulence.
4—stratiform clouds with little or no turbulence.

1680. What is indicated when a current SIGMET forecasts embedded thunderstorms?

1—Thunderstorms have been visually sighted.
2—Severe thunderstorms are embedded within a squall line.
3—Thunderstorms are dissipating and present no serious problem to IFR flight.
4—Thunderstorms are obscured by massive cloud layers and cannot be seen.

1681. Crests of standing mountain waves may be marked by stationary, lens-shaped clouds known as

1—cumulonimbus mamma clouds.
2—standing lenticular clouds.
3—roll clouds.
4—rotor clouds.

1682. Hazardous wind shear is commonly encountered near the ground

1—near thunderstorms and during periods when the wind velocity is stronger than 35 kts.
2—during periods when the wind velocity is stronger than 35 kts. and near mountain valleys.
3—during periods of strong temperature inversion and near thunderstorms.
4—near mountain valleys and on the windward side of a hill or mountain.

1683. Where does wind shear occur?

1—Only at higher altitudes, usually in the vicinity of jetstreams.
2—At any level, and it can exist in both a horizontal and vertical direction.
3—Primarily at lower altitudes in the vicinity of mountain waves.
4—Only in the vicinity of thunderstorms.

1684. A pilot can expect a wind shear zone in a temperature inversion, whenever the windspeed at 2,000 to 4,000 ft. above the surface is at least

1—5 kts.
2—10 kts.
3—15 kts.
4—25 kts.

1685. An in-flight condition necessary for structural icing to form is

1—cumuliform clouds.
2—cirrostratus clouds.
3—stratiform clouds.
4—visible moisture.

1686. In which environment is aircraft structural ice most likely to have the highest accumulation rate?

1—Cumulus clouds.
2—Cirrus clouds.
3—Stratus clouds.
4—Freezing rain.

1687. Which condition is favorable to the development of carburetor icing?

1—Any temperature below freezing and a relative humidity of less than 50 percent.
2—Temperature between 32° F and 50° F and low humidity.
3—Temperature between 0° F and 20° F and high humidity.
4—Temperature between 20° F and 70° F and high humidity.

1688. The possibility of carburetor icing should always be considered when operating in conditions where the

1—temperature is as high as 95° F and the relative humidity is 30 percent or greater.
2—relative humidity range is from 25 percent to 100 percent, regardless of temperature.
3—relative humidity is between 30 percent and 100 percent and the temperature is between 0° F and 32 F.
4—temperature is as high as 70° F and the relative humidity is greater than 50 percent.

1689. What conditions are necessary for the formation of thunderstorms?

1—Lifting force, high humidity, and unstable conditions.
2—High humidity, high temperature, and cumulus clouds.
3—Low pressure, high humidity, and cumulus clouds.
4—Lifting force, high temperature, and unstable conditions.

1690. During the life cycle of a thunderstorm, which stage is characterized predominately by downdrafts?

1—Cumulus.
2—Dissipating.
3—Mature.
4—Anvil.

1691. Thunderstorms reach their greatest intensity during the

1—updraft stage.
2—mature stage.
3—downdraft stage.
4—cumulus stage.

1692. What is the sky condition depicted for Chicago Midway Airport (MDW) in Figure 48?

1—Thin overcast, measured ceiling 700 ft., overcast 1,100 ft., visibility 2 mi. in rain plus fog.
2—Sky partially obscured, measured ceiling 700 overcast, visibility 1-1/2, heavy rain, fog.
3—Thin overcast measured 700 ft. overcast, visibility 1-1/2, heavy rain, fog.
4—Sky partially obscured, measured ceiling 700 overcast, visibility 11, occasionally 2, with rain and heavy fog.

1693. Which of the reporting stations in Figure 48 have VFR weather?

1—All.
2—All except JFK.
3—All except JFK and MDW.
4—INK only.

1694. The wind direction and velocity at JFK (Figure 48) is from

1—180° at 40 kts.
2—040° variable 22 to 30 kts.
3—180° at 4 kts.
4—018° at 4 to 6 kts.

1695. What are the wind conditions at Wink, Texas (INK)? (See Figure 48.)

1—Calm.
2—111° gusting to 18 kts.
3—011°, 12 kts. gusting to 18 kts.
4—110°, 12 kts. gusting to 18 kts.

1696. Radar weather reports are of special interest to pilots because they report

1—large areas of low ceilings and fog.
2—location of precipitation along with type, intensity, and trend.
3—location of broken to overcast clouds.
4—icing conditions.

1697. From which primary source should information be obtained regarding expected weather at your destination and estimated time of arrival?

1—Low Level Prog Chart.
2—Weather Depiction Chart.
3—Terminal Forecast.
4—Radar Summary and Weather Depiction Chart.

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INK SA 1854 CLR 15 106/77/63/1112G18/000
BOI SA 1854 150 SCT 30 181/62/42/1304/015
LAX SA 1852 7 SCT 250 SCT 6HK 129/60/59/2504/991
MDW RS 1856 -X M7 OVC 11/2R+F 990/63/61/3205/980/RF2 RB12
JFK RS 1853 W5 X 1/2F 180/68/64/1804/006/R04RVR22V30 TWR VSBY 1/4
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Figure 48

1698. Why is frost considered hazardous to flight operation?

1—The increased weight requires a greater takeoff distance.
2—Frost changes the basic aerodynamic shape of the airfoil.
3—Frost decreases control effectiveness.
4—Frost causes early airflow separation resulting in a loss of lift.

1699. Which conditions result in the formation of frost?

1—The freezing of dew.
2—The collecting surface's temperature is at or below freezing and small droplets of moisture fall on the collecting surface.
3—The temperature of the collecting surface is at or below the dew point of the adjacent air and the dew point is below freezing.
4—Small drops of moisture falling on the collecting surface when the surrounding air temperature is at or below freezing.

1700. Frost which has not been removed from the lifting surfaces of an airplane before flight

1—may prevent the airplane from becoming airborne.
2—will change the camber (curvature of the wing) thereby increasing lift during the takeoff.
3—may cause the airplane to become airborne with a lower angle of attack and at a lower indicated airspeed.
4—would present no problems since frost will blow off when the airplane starts moving during takeoff.

1701. What feature is normally associated with the cumulus stage of a thunderstorm?

1—Roll cloud.
2—Continuous updraft.
3—Frequent lightning.
4—Beginning of rain at the surface.

1702. Which weather phenomenon signals the beginning of the mature stage of a thunderstorm?

1—The appearance of an anvil top.
2—The start of rain at the surface.
3—Growth rate of cloud is maximum.
4—Strong turbulence in the cloud.

1703. Thunderstorms which generally produce the most intense hazard to aircraft are

1—air mass thunderstorms.
2—steady-state thunderstorms.
3—warm front thunderstorms.
4—squall line thunderstorms.

1704. Which weather phenomenon is always associated with a thunderstorm?

1—Lightning.
2—Heavy rain showers.
3—Supercooled raindrops.
4—Hail.

1705. If there is thunderstorm activity in the vicinity of an airport at which you plan to land, which hazardous and invisible atmospheric phenomenon might be expected on the landing approach?

1—St. Elmo's fire.
2—Wind shear turbulence.
3—Tornadoes.
4—Virga.

1706. A nonfrontal, narrow band of active thunderstorms, that often develop ahead of a cold front, is known as

1—an occlusion.
2—a prefrontal system.
3—a squall line.
4—a shear line.

1707. Upon encountering severe turbulence, which condition should the pilot attempt to maintain?

1—Constant altitude.
2—Constant airspeed (V_A).
3—Level flight attitude.
4—Constant altitude and constant airspeed.

1708. What situation is most conducive to the formation of radiation fog?

1—Warm, moist air over low, flatland areas on clear, calm nights.
2—Moist, tropical air moving over cold, offshore water.
3—The movement of cold air over much warmer water.
4—Light wind moving warm, moist air upslope during the night.

1709. What types of fog depend upon a wind in order to exist?

1—Radiation fog and ice fog.
2—Steam fog and downslope fog.
3—Precipitation-induced fog and ground fog.
4—Advection fog and upslope fog.

1710. In which situation is advection fog most likely to form?

1—A warm, moist air mass on the windward side of mountains.
2—An air mass moving inland from the coast in winter.
3—A light breeze blowing colder air out to sea.
4—Warm, moist air settling over a warmer surface under no-wind conditions.

1711. What minimum upward current must a glider encounter to maintain altitude?

1—At least 2 ft./sec.
2—The same as the glider's sink rate.
3—The same as the adjacent down currents.
4—Greater than the adjacent down currents.

1712. Which is considered to be the most hazardous condition when soaring in the vicinity of thunderstorms?

1—Static electricity.
2—Lightning.
3—St. Elmo's fire.
4—Wind shear and turbulence.

1713. The development of thermals depends upon

1—a counterclockwise circulation of air.
2—temperature inversions.
3—solar heating.
4—uneven terrain.

1714. On which side of a rocky knoll, that is surrounded by vegetation, should a pilot find the best thermals?

1—On the side facing the sun.
2—On the downwind side.
3—Exactly over the center.
4—Downwind and 90° to the side facing the sun.

1715. One recommended method for locating thermals is to

1—fly an ever increasing circular path.
2—maintain a straight track downwind.
3—look for converging streamers of dust or smoke.
4—look for diverging streamers of dust or smoke.

1716. What is a recommended procedure for entering a dust devil for soaring?

1—Enter at low level and circle the edge in the same direction as the rotation.
2—Enter at low level and circle the edge opposite the direction of rotation.
3—Enter at above 500 ft. and circle the edge in the same direction as the rotation.
4—Enter at above 500 ft. and circle the edge opposite the direction of rotation.

1717. An important precaution when soaring in a dust devil is to

1—avoid the eye of the vortex because of extreme turbulence.
2—avoid the clear area at the outside edge of the dust because of severe downdrafts.
3—maintain the same direction as the rotation of the vortex for maximum lift.
4—avoid steep turns on the upwind side to prevent being blown into the vortex.

1718. One of the best visual indications of a thermal is

1—a fragmented cumulus cloud with a concave base.
2—a smooth cumulus cloud with a concave base.
3—a broken to overcast sky with cumulus clouds.
4—clouds forming at the base of a temperature inversion.

1719. How can a pilot find bubble thermals?

1—Look for wet areas where recent showers have occurred.
2—Look for birds that are soaring in areas of intermittent heating.
3—Try the area just above the boundary of a temperature inversion.
4—Look for areas of local overcast sky.

1720. The most favorable type thermals for cross-country soaring may be found

1—just ahead of a warm front.
2—along thermal streets.
3—under mountain waves.
4—over altocumulus clouds.

1721. What indications are available to detect inversion layers, wind shear, and thermals?

1—Smoke or dust.
2—Cumulus cloud bases.
3—Dust or haze.
4—Temperature, dew point, and barometric pressure.

1722. What are some visual cues that identify a sea breeze front?

1—Cumulus clouds on the seaward side.
2—No restrictions to visibilities on either side.
3—A difference in visibility between land and sea.
4—Low stratus clouds on the landward side.

1723. Under what condition can enough lift be found for soaring under stable weather conditions?

1—Over steep escarpments or cliffs.
2—In mountain waves that form on the upwind side of the mountains.
3—Over isolated peaks when strong winds are present.
4—On the upwind side of hills or ridges with moderate winds present.

1724. Convective circulation patterns associated with sea breezes are caused by

1—warm and less dense air moving inland from over the water, causing it to rise.
2—water absorbing and radiating heat faster than the land.
3—land absorbing and radiating heat faster than the water.
4—cool and less dense air moving inland from over the water, causing it to rise.

1725. According to the Terminal Forecast for Oklahoma City (OKC) in Figure 49, the cold front should pass through

1—between 21Z and 02Z the next day.
2—between 18Z and 21Z with heavy thunderstorms.
3—between 1515Z and 18Z.
4—after 09Z the next day.

1726. What wind conditions are expected at Hobart (HBR) at 16Z? (See Figure 49.)

1—Calm.
2—115° at 15 kts.
3—300° at 10 kts.
4—320° at 15 kts. gusting to 25 kts.

1727. What ceiling is forecast for Gage (GAG) between 16Z and midnight Z? (See Figure 49.)

1—100 scattered.
2—6,000 scattered.
3—1,000 broken.
4—10,000 broken.

1728. What is the outlook for weather conditions at McAlester (MLC)? (See Figure 49.)

1—Ceilings 2,000–3,000 ft. with southerly winds.
2—Ceiling 700 ft., sky obscured, visibility 1/2 mi. in the thundershowers.
3—VFR except in the thundershowers, peak wind gusts 40 kts.
4—Marginal VFR due to low ceilings and thundershowers.

1729. The wind condition in the Terminal Forecast Outlook for Ponca City (PNC) in Figure 49 is

1—missing.
2—for velocities of 25 kts. or stronger.
3—for a wind shift from south to northwest.
4—for the wind to change from a gusty condition to calm.

1730. When is the wind forecast to shift at Tulsa (TUL)? (See Figure 49.)

1—15Z.
2—Between 19Z and 23Z.
3—Between 23Z and 09Z the next day.
4—After 09Z the next day.

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OK FT 011447

GAG FT 011515 100 SCT 250 SCT 2610. 16Z 60 SCT C100 BKN 3315G22 CHC C50 BKN
 5TRW. 01Z 250 SCT 3515G25. 09Z VFR WIND..

HBR FT 011515 C120 BKN 250 BKN 3010. 17Z 100 SCT C250 BKN 3215G25 CHC
 C30 BKN 3TRW. 00Z 250 SCT 3515G25.  092 VFR WIND..

MLC FT 011515 C20 BKN 1815 BKN OCNL SCT. 20Z C30 BKN 1815G22 CHC C20 BKN
 1TRW. 03Z C30 BKN 2015 CHC C7 X 1/2TRW+G40. 09Z MVFR CIG TRW..

OKC FT 011515 C12 BKN 140 BKN 1815G28 LWR BKN V SCT. 18Z C30 BKN 250 BKN
 2315G25 LWR BKN OCNL SCT CHC C7 X 1/2TRW+G40. 21Z CFP 100 SCT C250
 BKN 3315G25 CHC C30 BKN 5TRW-. 02Z 100 SCT 250 SCT 3515G25. 09Z VFR
 WIND..

PNC FT 011515 C100 BKN 250 BKN 1810. 16Z CFP 20 SCT C100 BKN 3115 SCT V
 BKN. 00Z 250 SCT 3515G25.  09Z VFR WIND..

TUL FT 011515 C20 BKN 1915G22. 19Z C30 BKN 1815G25 CHC 3TRW. 23Z CFP C100
 BKN 250 BKN 3215G25 CHC C30 BKN 5TRW.  09Z VFR WIND..
```

Figure 49

1731. To best determine forecast weather conditions between weather reporting stations, the pilot should refer to

1—pilot reports.
2—prognostic charts.
3—weather maps.
4—Area Forecasts.

1732. To determine the freezing level and areas of probable icing aloft, the pilot should refer to the

1—Radar Summary Chart.
2—Weather Depiction Chart.
3—Area Forecast.
4—Surface Analysis.

1733. To obtain a continuous transcribed weather briefing including winds aloft and route forecasts for a cross-country flight, a pilot should monitor

1—a TWEB on a low-frequency radio receiver.
2—a VHF radio receiver tuned to an ATIS frequency.
3—the regularly scheduled weather broadcast on a VOR frequency.
4—a high-frequency radio receiver tuned to the En Route Flight Advisory Service (Flight Watch) station.

1734. Individual forecasts for specific routes of flight can be obtained from which weather service?

1—Transcribed Weather Broadcasts.
2—Terminal Forecasts.
3—Area Forecasts.
4—In-flight advisories.

1735. TWEB's (Transcribed Weather Broadcasts) may be monitored by tuning the appropriate radio receiver to certain

1—FSS communications frequencies.
2—airport advisory frequencies.
3—VOR and NDB frequencies.
4—NDB frequencies only.

1736. SIGMET's are issued as a warning of weather conditions hazardous

1—particularly to light aircraft.
2—to all aircraft.
3—only to light aircraft operations.
4—particularly to heavy aircraft.

1737. AIRMET's are issued as a warning of weather conditions hazardous

1—to all airplanes.
2—particularly to light airplanes.
3—to VFR operations only.
4—particularly to heavy airplanes.

1738. Which in-flight advisory would contain information on severe icing?

1—Convective SIGMET.
2—SIGMET.
3—AIRMET.
4—PIREP.

1739. What information is contained in a convective SIGMET in the conterminous United States?

1—Tornadoes, embedded thunderstorms, and hail 3/4 in. or greater in diameter.
2—Severe icing, severe turbulence, or widespread dust storms lowering visibility to less than 3 mi.
3—Weather less than basic VFR and sustained winds of 30 kts. or greater at the surface.
4—Ceilings less than 500 ft. and visibility less than 1 mi.

1740. What information is provided by the Radar Summary Chart that is not shown on other weather charts?

1—Lines and cells of hazardous thunderstorms.
2—Ceilings and precipitation between reporting stations.
3—Types of precipitation between reporting stations.
4—Areas of cloud cover and icing levels within the clouds.

1741. What values are used for Winds Aloft Forecasts?

1—Magnetic direction and knots.
2—Magnetic direction and miles per hour.
3—True direction and knots.
4—True direction and miles per hour.

1742. When telephoning a weather briefing facility for preflight weather information, pilots should

1—identify themselves as pilots.
2—tell the number of hours they have flown within the preceding 90 days.
3—state the number of occupants on board and the color of the aircraft.
4—state that they possess a current medical certificate.

1743. When telephoning a weather briefing facility for preflight weather information, pilots should state

1—that you possess a current medical certificate.
2—your intended route, destination, and type of aircraft.
3—the color of the aircraft and number of occupants on board.
4—your total flight time.

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1744. When telephoning a weather briefing facility for preflight weather information, pilots should state

1—the number of hours you have flown within the preceding 90 days.
2—that you possess a current medical certificate.
3—whether you intend to fly VFR only.
4—the color of the aircraft and number of occupants on board.

1745. How should you establish contact with an EFAS (En Route Flight Advisory Service) station, and what service would you normally expect?

1—Call EFAS on 122.2 for routine weather, current reports on hazardous weather, and altimeter settings.
2—Call flight assistance on 122.5 for advisory service pertaining to severe weather.
3—Call Flight Watch on 122.0 for information regarding actual weather and thunderstorm activity along your route.
4—Call ARTCC on assigned frequency and ask for Flight Watch services.

1746. What service should a pilot normally expect from an En Route Flight Advisory Service station?

1—Actual weather information and thunderstorm activity along the route.
2—Preferential routing and provide radar vectoring to circumnavigate severe weather.
3—Severe weather information, changes to flight plans, and receive routine position reports.
4—Radar vectors for traffic avoidance, routine weather advisories, and altimeter settings.

1747. The section of the Area Forecast entitled SIG CLDS AND WX contains a

1—summary of cloudiness and weather significant to flight operations broken down by states or other geographical areas.
2—summary of forecast sky cover, cloud tops, visibility, and obstructions to vision along specific routes.
3—statement of AIRMETS and SIGMETS still in effect at the time of issue.
4—summary of only those clouds and weather considered adverse to safe flight operations.

1748. What weather is forecast for the Gulf Coast area just ahead of the cold front during the first 12 hr.? (See Figure 50.)

1—Marginal VFR to IFR with intermittent thundershowers and rain showers.
2—IFR with moderate or greater turbulence over the coastal areas.
3—Thunderstorm cells moving northeastward ahead of the front.
4—Rain and drizzle dissipating, clearing along the front.

1749. For what phase of flight planning are the Significant Weather Progs designed? (See Figure 50.)

1—A complete set of weather forecasts for overall planning.
2—Information to avoid areas and/or altitudes of most significant icing and turbulence.
3—An analysis of frontal activity, cloud coverage, and areas of precipitation.
4—Overall depiction of current ceilings and visibilities with fronts and icing levels.

1750. Interpret the weather symbol depicted in lower California on the 12-hour Significant Weather Prog in Figure 50.

1—Moderate turbulence, surface to 18,000 ft.
2—Thunderstorm tops at 18,000 ft.
3—Base of clear air turbulence, 18,000 ft.
4—Moderate turbulence, 180 mb level.

1751. The band of IFR weather associated with the cold front in the western states as depicted in Figure 50 is forecast to move

1—southeast at 30 kts. with moderate snow showers.
2—northeast at 12 kts. with the front and producing snow showers.
3—eastward at 30 kts. with the low and producing snow showers.
4—eastward at 30 kts. with continuous snow.

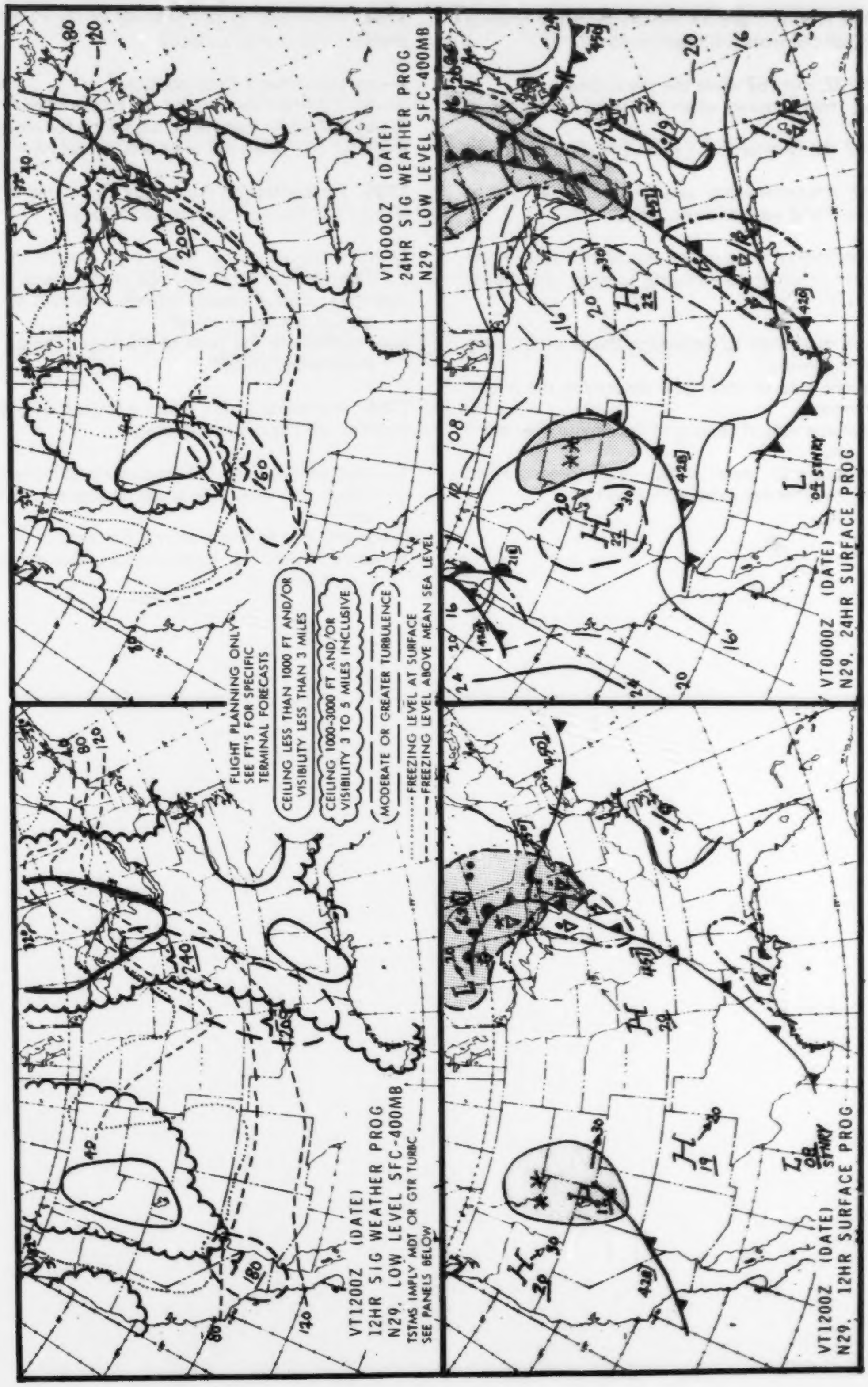
VT1200Z (DATE)
12HR SIG WEATHER PROG
N29. LOW LEVEL SFC-400MB
TSTMS IMPLY MDT OR GTR TURBC
SEE PANELS BELOW
VT0000Z (DATE)
24HR SIG WEATHER PROG
N29. LOW LEVEL SFC-400MB
FLIGHT PLANNING ONLY
SEE FT'S FOR SPECIFIC
TERMINAL FORECASTS
CEILING LESS THAN 1000 FT AND/OR
VISIBILITY LESS THAN 3 MILES
CEILING 1000-3000 FT AND/OR
VISIBILITY 3 TO 5 MILES INCLUSIVE
MODERATE OR GREATER TURBULENCE
FREEZING LEVEL AT SURFACE
FREEZING LEVEL ABOVE MEAN SEA LEVEL
VT1200Z (DATE)
N29. 12HR SURFACE PROG
VT0000Z (DATE)
N29. 24HR SURFACE PROG

Figure 50

1752. At what time is there an indication in the briefing in Figure 51 that thermals will begin to form?

1—Between 13Z and 15Z while the sky is clear.
2—After 15Z (midmorning) when scattered clouds begin to form.
3—About 20Z (early afternoon) when the wind begins to increase.
4—After 20Z (midafternoon) when cloud bases are at their highest and wind at a peak level.

1753. What additional information should be asked of the weather briefer in order to evaluate soaring conditions? (See Figure 51.)

1—The upper soundings to determine the thermal index at all soaring levels.
2—Dry adiabatic rate of cooling to determine the height of cloud bases.
3—Moist adiabatic rate of cooling to determine the height of cloud tops.
4—The temperature, dew point, and pressure to determine the thermal index at the surface.

1754. According to the briefing in Figure 51, the most ideal time to launch balloons is

1—as soon after 13Z as possible.
2—at 15Z when the ground will be partially shaded.
3—at 20Z when there is enough wind for cross-country.
4—after 20Z when the wind and clouds have stabilized.

1755. What effect do the clouds mentioned in the briefing (Figure 51) have on soaring conditions?

1—All thermals stop at the base of the clouds.
2—Thermals persist to the tops of the clouds at 25,000 ft.
3—The scattered clouds indicate thermals at least to the tops of the lower clouds.
4—Thermals to the base of the lower clouds and bubble thermals to 25,000 ft.

1756. According to the briefing (Figure 51), good balloon weather will begin to deteriorate

1—soon after 13Z as the wind starts to increase.
2—about 15Z when the lower scattered clouds begin to form.
3—at 20Z due to sharp increase in wind conditions.
4—after 20Z as the high pressure area moves closer to Caddo Mills.

This is a telephone weather briefing from the Dallas FSS for a local operation of gliders and lighter-than-air at Caddo Mills, Texas (about 30 miles east of Dallas). The briefing is at 13Z.

"There are no adverse conditions reported or forecast for today."

'A weak low pressure over the Texas Panhandle and eastern New Mexico is causing a weak southerly flow over the area.'

'Current weather here at Dallas is clear, visibility 12 miles, temperature 70, dew point 48, wind south 5 knots, altimeter 29 point 78.'

'By 15Z we should have a few scattered clouds at 5 thousand AGL, with higher scattered cirrus at 25 thousand MSL. After 20Z the wind should pick up to about 15 knots from the south.'

'The winds aloft are: 3 thousand 170 at 7, temperature 20; 6 thousand 200 at 18, temperature 14; 9 thousand 210 at 22, temperature 8; 12 thousand 225 at 27, temperature 0; 18 thousand 240 at 30, temperature -7."

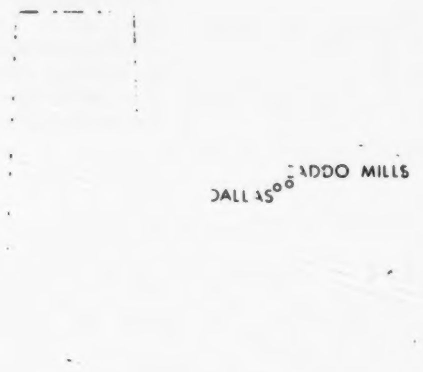

Figure 51

1757. What is the widespread system affecting the en route weather described in the weather briefing in Figure 52?

1—Temperature inversion.
2—Low pressure trough.
3—Occluded front.
4—Warm front.

1758. What change in weather conditions is indicated at Boston from the time of the briefing until departure time? (See Figure 52.)

1—IFR to VFR conditions.
2—Second layer of clouds and visibility lowering.
3—Rain decreasing with pressure and temperature remaining stable.
4—Lowering of ceiling and visibility to 1,000 ft. and 3 mi. in thundershowers.

1759. Why are there two separate levels of freezing temperatures reported? (See Figure 52.)

1—Freezing temperatures from 4,000 ft. up reported at the cloud layers only.
2—Freezing temperatures at one level on each side of the temperature inversion.
3—Only the levels where airframe icing has been forecast or reported by pilots.
4—One layer contains conditions for airframe icing and the other contains conditions for carburetor icing.

1760. Where is there a possibility of turbulence on the proposed route? (See Figure 52.)

1—Below the freezing level along the entire route.
2—Between 12,000 and 14,000 ft.
3—In the Boston area.
4—Albany to New York.

1761. Which portion of the route indicates questionable VFR conditions? (See Figure 52.)

1—Western Massachusetts through central New York.
2—Eastern Massachusetts to the New York border.
3—Central New York through to Buffalo.
4—In the Buffalo area.

This is a pilot weather briefing from the FSS at Boston, Massachusetts, for a flight to Buffalo, New York. The pilot advises that the departing time will be 18Z and the ETA is approximately 3 hours.

"Conditions are for marginal VFR and occasionally IFR conditions for the entire flight. AIRMET DELTA TWO calls for occasional moderate icing in the clouds and precipitation from Buffalo to central Massachusetts from 4 thousand to 6 thousand. SIGMET NINE BRAVO warns of scattered embedded thundershowers along coastal Massachusetts continuing beyond 18Z."

'At 12Z a warm front extended from a low centered near Toledo, Ohio, eastward across central Pennsylvania and into the Atlantic just south of Long Island.'

'Current weather here at Boston is 2 thousand scattered, ceiling 4 thousand overcast, 6 miles in light rain and fog, temperature 43, dew point 39, wind 110 at 15, altimeter 29 point 90. Here at Boston at departure time, we should have 2 thousand scattered 3 thousand 5 hundred overcast, 5 miles in light rain and fog.'

'You should experience VFR conditions through eastern and central Massachusetts with marginal and occasionally IFR conditions from western Massachusetts through central New York and VFR the remainder of the route. Currently, Buffalo is reporting 15 hundred overcast, 5 miles visibility in light rain and fog, wind 090 at 10 gusting to 20.'

'En route, clouds are layered from 1 thousand to above 25 thousand. Visibilities will be 5 miles, occasionally 3 miles in precipitation and fog. AIRMET DELTA TWO warns of occasionally moderate mixed icing in the clouds and precipitation from 4 to 6 thousand from New York to central Massachusetts. Convective SIGMET NINE BRAVO forecasts a freezing layer, 4 to 6 thousand New York to central Massachusetts, otherwise the freezing level is 12 thousand at Buffalo sloping to 14 thousand at Boston. At 1435Z the pilot of a B747 reported mixed icing during descent from 6 thousand to 4 thousand.'

'At 21Z Buffalo should have 12 hundred overcast, 5 miles visibility in light rain and fog.

'Winds aloft forecast: From Boston to Albany, 3 thousand 150 at 18, 6 thousand 160 at 35, 9 thousand 270 at 35, 12 thousand and above 270 at 45. From Albany to Buffalo, 3 thousand 100 at 18, 6 thousand 120 at 30, 9 thousand and above 240 at 35 to 45."

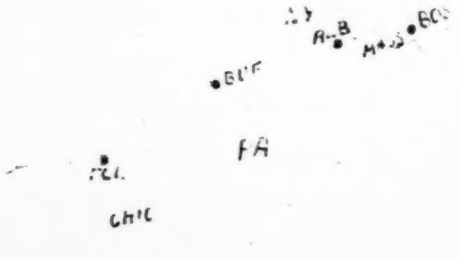

Figure 52

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1762. What weather phenomenon reported in the TWEB in Figure 53 indicates a layer of above freezing temperatures above 7 or 8 thousand?

1—Snow.
2—Ice pellets.
3—Wind shift aloft.
4—Temperature/dew point spread.

1763. The boundary between the air from the high in Nebraska and the low in New Mexico as described by the TWEB in Figure 53 is between

1—the surface and 6,000 ft.
2—6,000 ft. and 9,000 ft.
3—9,000 ft. and 12,000 ft.
4—12,000 ft. and 15,000 ft.

1764. What type of icing may occur in the conditions described in the TWEB in Figure 53?

1—Structural and induction icing below 8 thousand and carburetor icing in the warmer air above.
2—Carburetor induction, and structural icing from the surface to 7 or 8 thousand.
3—Structural icing from the surface to 7 or 8 thousand and above 15 thousand.
4—Carburetor, structural, and induction icing from the surface to 7 or 8 thousand and structural above 15 thousand.

1765. What type clouds normally produce the icing mentioned by the PIREP in the TWEB? (See Figure 53.)

1—Cumulus.
2—Stratocumulus.
3—Stratus.
4—Cumulonimbus.

1766. What condition described in the TWEB in Figure 53, is causing the fog?

1—Precipitation and turbulence.
2—Temperature/dew point spread and light wind.
3—Moist air moving over a colder surface.
4—Temperature below freezing and moisture sublimating directly as ice crystals.

1767. In which direction is the precipitation moving? (See Figure 53.)

1—North.
2—Northeast.
3—East.
4—Southeast.

This is a Transcribed Weather Broadcast from Oklahoma City, Oklahoma, with Oklahoma City to Amarillo, Texas route. Valid until 23Z.

"Synopsis: Rapidly developing upper level low-pressure system over eastern New Mexico moving eastward over the area through the period. A strong low-level easterly flow south of an artic high-pressure center in Nebraska continuing over the area."

'Adverse conditions: IFR conditions due to low ceilings and visibilities for the west portion of the route spreading east over the entire route by midafternoon. Occasional moderate to severe icing in the clouds and precipitation from the surface to 8 thousand MSL for the west portion of the route. Occasional moderate turbulence 20 to 30 thousand along the route due to the jet stream. Low-level wind shear along the route due to strong surface winds.'

'Route forecast, Oklahoma City-Amarillo: The west portion of the route, ceilings at or below 1 thousand and visibilities occasionally below 3 miles in snow, ice pellets, and fog. The east portion of the route, ceilings 3 thousand becoming ceilings at or below 1 thousand, and visibilities occasionally below 3 miles in snow and fog by midafternoon. Tops to 17 thousand MSL, also scattered to broken clouds at or above 25 thousand MSL along the entire route.'

'Winds aloft at Oklahoma City: 3 thousand 050 at 30, 6 thousand 070 at 50, 9 thousand 110 at 40, 12 thousand 230 at 40, 18 thousand 230 at 65, 24 thousand 240 at 75, 30 thousand 240 at 87, 34 thousand 240 at 80, 39 thousand 240 at 60. Amarillo: 3 thousand 080 at 40, 6 thousand 090 at 45, 9 thousand 120 at 35, 12 thousand 230 at 40, 18 thousand 240 at 70, 24 thousand 240 at 85, 30 thousand 250 at 96, 34 thousand 250 at 90, 39 thousand 240 at 60.'

'Radar reports: At 1435Z, Amarillo radar shows an area of light snow and ice pellets with 7 tenths coverage extending from Amarillo to Gage to Childress to Amarillo. The area has increased in size from past hour. Maximum tops are uniform at 14 thousand MSL. The area is moving to the northeast at 35 knots.'

'Surface weather reports: Amarillo, 1520Z, measured ceiling 8 hundred overcast, visibility 3 miles in light snow and fog, temperature 25, dew point 23, wind 090 at 25 gusting to 37, altimeter 29 point 67, the ice pellets began at 25 after the hour and ended 40 minutes past the hour; Gage, 1515Z, measured ceiling 3 hundred broken, 10 thousand overcast, visibility 2 miles in light snow and fog, temperature 22, dew point 20, wind 070 at 18 gusting to 30, altimeter 29 point 97. Childress, 5 hundred scattered, measured ceiling 9 hundred overcast, visibility 6 miles in light snow/ice pellets/fog, temperature 30, dew point 28, wind 110 at 25 gusting to 35, altimeter 29 point 88. Hobart, measured ceiling 25 hundred broken, 5 thousand overcast, visibility 7 miles, temperature 27, dew point 24, wind 080 at 20 gusting to 32, altimeter 29 point 94, snow showers of unknown intensity to the west. Oklahoma City, measured ceiling 3 thousand broken, 8 thousand overcast, visibility 7 miles, temperature 21, dew point 16, wind 040 at 15 gusting to 28, altimeter 30 point 02.'

'Pilot reports: 30 miles east of Amarillo, a pilot of a Boeing 727 during a climbout at Amarillo reported moderate rime icing from the surface to 7 thousand, tops of clouds 15 thousand with cirrus above and moderate turbulence from the surface to 5 thousand."

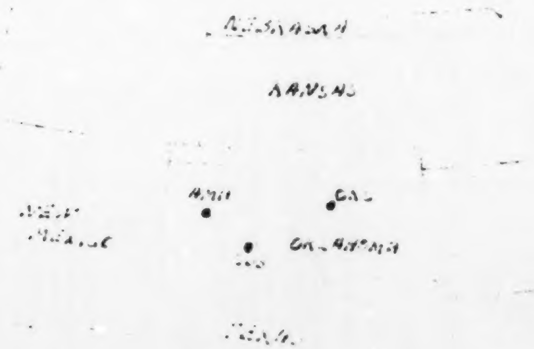


Figure 53

1768. To preclude the effects of hypoxia,

1—avoid flying above 10,000 ft. MSL for prolonged periods without breathing supplemental oxygen.
2—rely on your body's built-in alarm system to warn when you are not getting enough oxygen.
3—try swallowing, yawning, or holding the nose and mouth shut and forcibly try to exhale.
4—avoid hyperventilation which is caused by rapid heavy breathing and results in excessive carbon dioxide in the bloodstream.

1769. Rapid or extra deep breathing while using oxygen can cause a condition known as

1—hypoxia.
2—aerosinusitis.
3—aerotitis.
4—hyperventilation.

1770. A pilot should be able to overcome the symptoms or avoid future occurrences of hyperventilation by

1—closely monitoring the flight instruments to control the airplane.
2—slowing the breathing rate, breathing into a bag, or talking aloud.
3—increasing the breathing rate in order to increase lung ventilation.
4—refraining from the use of over-the-counter remedies and drugs such as antihistamines, cold tablets, tranquilizers, etc.

1771. Which would most likely result in hyperventilation?

1—Emotional tension, anxiety, or fear.
2—The excessive consumption of alcohol.
3—An extremely slow rate of breathing and insufficient oxygen.
4—An extreme case of relaxation or sense of well-being.

1772. Large accumulations of carbon monoxide in the human body result in

1—tightness across the forehead.
2—loss of muscular power.
3—an increased sense of well-being.
4—being too warm.

1773. Susceptibility to carbon monoxide poisoning increases as

1—altitude increases.
2—altitude decreases.
3—air pressure increases.
4—humidity of the air decreases.

1774. A pilot is more subject to spatial disorientation if

1—ignoring or overcoming the sensations of muscles and inner ear.
2—kinesthetic senses are ignored.
3—eyes are moved often in the process of cross-checking the flight instruments.
4—body signals are used to interpret flight attitude.

1775. A pilot experiences spatial disorientation during flight in a restricted visibility condition. The best way to overcome the effect is to

1—depend on sensations received from the fluid in the semicircular canals of the inner ear.
2—concentrate on any yaw, pitch, and roll sensations.
3—consciously slow your breathing rate until symptoms clear and then resume normal breathing rate.
4—rely upon the aircraft instrument indications.

1776. A state of temporary confusion resulting from misleading information being sent to the brain by various sensory organs is defined as

1—spatial disorientation.
2—hyperventilation.
3—hypoxia.
4—motion sickness.

1777. What preparation should a pilot make to adapt the eyes for night flying?

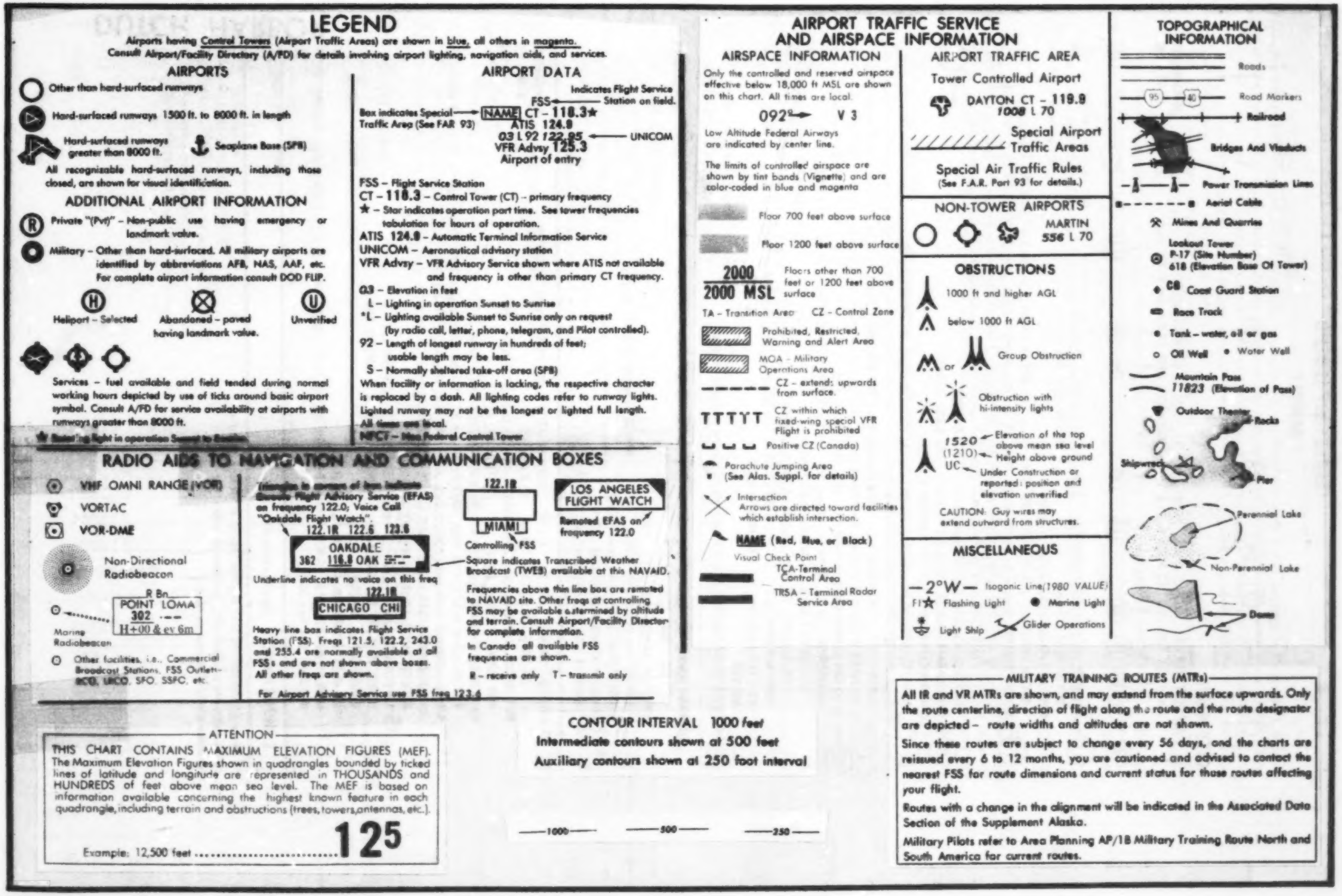
1—Wear sunglasses after sunset until ready for flight.
2—Avoid red lights at least 30 min. before the flight.
3—Wear amber colored glasses at least 30 min. before the flight.
4—Avoid bright white lights at least 30 min. before the flight.

1778. What is the most effective way to use the eyes during night flight?

1—Look only at far away, dim lights.
2—Scan slowly to permit offcenter viewing.
3—Blink the eyes rapidly when concentrating on an object.
4—Concentrate directly on each object for a few seconds.

APPENDIX 2

SECTIONAL AERONAUTICAL CHART
SCALE 1:500,000



LEGEND

Airports having Control Towers (Airport Traffic Areas) are shown in blue, all others in magenta.
Consult Airport/Facility Directory (A/FD) for details involving airport lighting, navigation aids, and services.

AIRPORTS

- Other than hard-surfaced runways
- Hard-surfaced runways 1500 ft. to 8000 ft. in length
- Hard-surfaced runways greater than 8000 ft.
- Seaplane Base (SPB)

All recognizable hard-surfaced runways, including those closed, are shown for visual identification.

ADDITIONAL AIRPORT INFORMATION

- Private "(Pvt)" – Non-public use having emergency or landmark value.
- Military – Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP.
- Heliport – Selected
- Abandoned – paved having landmark value.
- Unverified

Services – fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. Consult A/FD for service availability at airports with runways greater than 8000 ft.

★ Rotating light in operation Sunset to Sunrise.

AIRPORT DATA

Box indicates Special Traffic Area (See FAR 93) → NAME CT – 118.3★

FSS ← Indicates Flight Service Station on field.

ATIS 124.9

03 L 92 122.95 ← UNICOM

VFR Advsy 125.3

Airport of entry

FSS – Flight Service Station
CT – 118.3 – Control Tower (CT) – primary frequency
★ – Star indicates operation part time. See tower frequencies tabulation for hours of operation.
ATIS 124.9 – Automatic Terminal Information Service
UNICOM – Aeronautical advisory station
VFR Advsy – VFR Advisory Service shown where ATIS not available and frequency is other than primary CT frequency.
03 – Elevation in feet
L – Lighting in operation Sunset to Sunrise
*L – Lighting available Sunset to Sunrise only on request (by radio call, letter, phone, telegram, and Pilot controlled).
92 – Length of longest runway in hundreds of feet; usable length may be less.
S – Normally sheltered take-off area (SPB)

When facility or information is lacking, the respective character is replaced by a dash. All lighting codes refer to runway lights. Lighted runway may not be the longest or lighted full length.

All times are local.

NFCT – Non-Federal Control Tower

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

- VHF OMNI RANGE (VOR)
- VORTAC
- VOR-DME
- Non-Directional Radiobeacon
- Marine Radiobeacon
- Other facilities, i.e., Commercial Broadcast Stations, FSS Outlets-RCO, LRCO, SFO, SSFC, etc.

R Bn
POINT LOMA
302 · – –
H+00 & ev 6m

Triangles in corners of box indicate Enroute Flight Advisory Service (EFAS) on frequency 122.0; Voice Call "Oakdale Flight Watch".

122.1R 122.6 123.6
OAKDALE
362 116.8 OAK

Underline indicates no voice on this freq

122.1R
CHICAGO CHI

Heavy line box indicates Flight Service Station (FSS). Freqs 121.5, 122.2, 243.0 and 255.4 are normally available at all FSSs and are not shown above boxes. All other freqs are shown.

122.1R
MIAMI
Controlling FSS

LOS ANGELES FLIGHT WATCH
Remoted EFAS on frequency 122.0

Square indicates Transcribed Weather Broadcast (TWEB) available at this NAVAID.

Frequencies above thin line box are remoted to NAVAID site. Other freqs at controlling FSS may be available determined by altitude and terrain. Consult Airport/Facility Director for complete information.

In Canada all available FSS frequencies are shown.

R – receive only T – transmit only

For Airport Advisory Service use FSS freq 123.6

ATTENTION

THIS CHART CONTAINS MAXIMUM ELEVATION FIGURES (MEF). The Maximum Elevation Figures shown in quadrangles bounded by ticked lines of latitude and longitude are represented in THOUSANDS and HUNDREDS of feet above mean sea level. The MEF is based on information available concerning the highest known feature in each quadrangle, including terrain and obstructions (trees, towers, antennas, etc.).

Example: 12,500 feet .... 12^{5}

CONTOUR INTERVAL 1000 feet

Intermediate contours shown at 500 feet

Auxiliary contours shown at 250 foot interval

——1000—— ——500—— ——250——

AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

AIRSPACE INFORMATION

Only the controlled and reserved airspace effective below 18,000 ft MSL are shown on this chart. All times are local.

092° → V 3

Low Altitude Federal Airways are indicated by center line.

The limits of controlled airspace are shown by tint bands (Vignette) and are color-coded in blue and magenta

- Floor 700 feet above surface
- Floor 1200 feet above surface
- 2000 / 2000 MSL – Floors other than 700 feet or 1200 feet above surface

TA – Transition Area CZ – Control Zone

- Prohibited, Restricted, Warning and Alert Area
- MOA – Military Operations Area
- CZ – extends upwards from surface.
- TTTTT – CZ within which fixed-wing special VFR Flight is prohibited
- Positive CZ (Canada)
- Parachute Jumping Area (See Alas. Suppl. for details)
- Intersection – Arrows are directed toward facilities which establish intersection.
- NAME (Red, Blue, or Black) – Visual Check Point
- TCA-Terminal Control Area
- TRSA – Terminal Radar Service Area

AIRPORT TRAFFIC AREA

Tower Controlled Airport

DAYTON CT – 119.9
1008 L 70

Special Airport Traffic Areas

Special Air Traffic Rules
(See F.A.R. Part 93 for details.)

NON-TOWER AIRPORTS

MARTIN
556 L 70

OBSTRUCTIONS

- 1000 ft and higher AGL
- below 1000 ft AGL
- Group Obstruction
- Obstruction with hi-intensity lights

1520 ← Elevation of the top above mean sea level
(1210) ← Height above ground
UC ← Under Construction or reported: position and elevation unverified

CAUTION: Guy wires may extend outward from structures.

MISCELLANEOUS

—2°W— Isogonic Line (1980 VALUE)

Fl★ Flashing Light ● Marine Light

Light Ship Glider Operations

TOPOGRAPHICAL INFORMATION

- Roads
- Road Markers
- Railroad
- Bridges And Viaducts
- Power Transmission Lines
- Aerial Cable
- Mines And Quarries
- Lookout Tower P-17 (Site Number) 618 (Elevation Base Of Tower)
- CG Coast Guard Station
- Race Track
- Tank – water, oil or gas
- Oil Well ● Water Well
- Mountain Pass 11823 (Elevation of Pass)
- Outdoor Theater

MILITARY TRAINING ROUTES (MTRs)

All IR and VR MTRs are shown, and may extend from the surface upwards. Only the route centerline, direction of flight along the route and the route designator are depicted – route widths and altitudes are not shown.

Since these routes are subject to change every 56 days, and the charts are reissued every 6 to 12 months, you are cautioned and advised to contact the nearest FSS for route dimensions and current status for those routes affecting your flight.

Routes with a change in the alignment will be indicated in the Associated Data Section of the Supplement Alaska.

Military Pilots refer to Area Planning AP/1B Military Training Route North and South America for current routes.

DIRECTORY LEGEND
SAMPLE

① ③ ④ ⑤ ⑥ ⑦

CITY NAME
§ **AIRPORT NAME** (ORL) 4 E GMT-5(-4DT) 28°32′43″N 81°20′10″W **JACKSONVILLE**
200 B S4 **FUEL** 100, JET A OX 1, 2, 3 TPA— 1000(800) AOE CFR Index A Not insp. **H-4G, L-19C**

② ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑧

IAP

⑱ **RWY 07-25:** H6000X150 (ASPH-PFC) S-90, D-160, DT-300 HIRL CL
RWY 07: ALSF1. Trees. **RWY 25:** REIL. Rgt tfc.
RWY 13-31: H4620X100 (ASPH) HIRL
RWY 13: VASI(V2L)—GA 3.3° TCH 89′. Pole. **RWY 31:** VASI(V2L)—GA 3.1° TCH 36′. Tree. Rgt tfc.
⑲ **AIRPORT REMARKS:** Special Air Traffic Rules—Part 93, see Regulatory Notices. Attended 1200-0300Z‡. Parachute Jumping. CAUTION cattle and deer on arpt. Acft 100,000 lbs or over ctc Director of Aviation for approval (305) 894-9831. Fee for all airline charters, travel clubs and certain revenue producing acft. Flight Notification Service (ADCUS) available. Control Zone effective 1500-0700Z‡. ⑤
⑳ **WEATHER DATA SOURCES:** AWOS-1 120.3 (202) 426-8000. LLWAS.
㉑ **COMMUNICATIONS: ATIS** 127.25 **UNICOM** 122.95
NAME FSS (ORL) on fld. 123.65 122.65 122.2 LD305-894-0861. NOTAM FILE ORL.
Ⓡ **NAME APP/DEP CON** 128.35 (1200-0400Z‡) ⑤
TOWER 118.7 **GND CON** 121.7 **CLNC DEL** 125.55 **PRE TAXI CLNC** 125.5
TCA GROUP II: See VFR Terminal Area Chart.
㉒ **RADIO AIDS TO NAVIGATION:** NOTAM FILE ORL. VHF/DF ctc FSS.
(H) ABVORTAC 112.2 ■ MCO Chan 59 28°32′33″N 81°20′07″W at fld. 1110/8E.
NOTAM FILE MCO. TWEB avbl 1300-0100Z‡. ⑤
VOR unusable 050-060° beyond 15 NM below 5000′
HERNY NDB (LOM) 221 OR 28°30′24″N 81°26′03″W 067° 5.4 NM to fld.
ILS 109.9 I-ORL Rwy 07. LOM HERNY NDB
ASR/PAR
㉓ **COMM/NAVAID REMARKS:** Emerg frequency 121.5 not available at tower.

AIRPORT NAME (X30) 7 W GMT-5(-4DT) 28°31′50″N 81°32′26″W **JACKSONVILLE**
130 S4 **FUEL** 100 OX 2
RWY 18-36: 2430X150 (TURF) LIRL
RWY 18: Thld dsplcd 215′. Trees. **RWY 36:** Thld dsplcd 270′. Road.
AIRPORT REMARKS: Attended dawn-0300Z‡
COMMUNICATIONS: CTAF/UNICOM 122.8
NAME FSS (ORL) LC 894-0861. NOTAM FILE ORL.

---

§ **D AIRPORT NAME** (MCO) 6.1 SE GMT-5(-4DT) 28°25′53″N 81°19′29″W **JACKSONVILLE**
96 B **FUEL** 100. JET A LRA CFR Index D **H-4G, L-19C**
RWY 18R-36L: H12004X300 (CONC-GRVD) S-100, D-200, DT-400 HIRL **IAP**
RWY 18R: ALSF1. REIL. Rgt tfc. **RWY 36L:** ALSF1.
RWY 18L-36R: H12004X200 (ASPH) S-165, D-200, DT-400 HIRL
RWY 18L: LDIN. ALSF1. TDZ. REIL. VASI(V4L)—GA 3° TCH 36′. Thld dsplcd 300′. Trees. Rgt tfc. Arresting device.
AIRPORT REMARKS: Attended 1200-0300Z‡. ACTIVATE HIRL Rwy 18L-36R—123.0.
COMMUNICATIONS: CTAF 124.3 **ATIS** 127.75 **UNICOM** 122.8
NAME FSS (MCO) LC 894-0869 NOTAM FILE MCO.
Ⓡ **APP CON** 124.8 (337°-179°) 120.1 (180°-336°) **DEP CON** 120.15
TOWER 124.3 NFCT (1200-0400Z‡) **GND CON** 121.85 **CLNC DEL** 134.7
STAGE III SVC ctc **APP CON**
RADIO AIDS TO NAVIGATION: NOTAM FILE MCO.
NAME (H) VORTAC 112.2 MCO Chan 59 28°32′33″N 81°20′07″ W 173° 5.7 NM to fld. 1110/8E.
MLS Chan 514 Rwy 36R

E AIRPORT NAME (See PLYMOUTH)

All Bearings and Radials are Magnetic unless otherwise specified.
All mileages are nautical unless otherwise noted.
All times are GMT except as noted.

DIRECTORY LEGEND

LEGEND

This Directory is an alphabetical listing of data on record with the FAA on all airports that are open to the public, associated terminal control facilities, air route traffic control centers and radio aids to navigation within the conterminous United States, Puerto Rico and the Virgin Islands. Airports are listed alphabetically by associated city name and cross referenced by airport name. Facilities associated with an airport, but with a different name, are listed individually under their own name, as well as under the airport with which they are associated.

The listing of an airport in this directory merely indicates the airport operator's willingness to accommodate transient aircraft, and does not represent that the facility conforms with any Federal or local standards, or that it has been approved for use on the part of the general public.

The information on obstructions is taken from reports submitted to the FAA. It has not been verified in all cases. Pilots are cautioned that objects not indicated in this tabulation (or on charts) may exist which can create a hazard to flight operation.

Detailed specifics concerning services and facilities tabulated within this directory are contained in Airman's Information Manual, Basic Flight Information and ATC Procedures.

The legend items that follow explain in detail the contents of this Directory and are keyed to the circled numbers on the sample on the preceding page.

① CITY/AIRPORT NAME

Airports and facilities in this directory are listed alphabetically by associated city and state. Where the city name is different from the airport name the city name will appear on the line above the airport name. Airports with the same associated city name will be listed alphabetically by airport name and will be separated by a dashed rule line. All others will be separated by a solid rule line.

② NOTAM SERVICE

§—NOTAM "D" (Distance teletype dissemination) and NOTAM "L" (local dissemination) service is provided for airport. Absence of annotation § indicates NOTAM "L" (local dissemination) only is provided for airport. Airport NOTAM file identifier will be shown as "NOTAM FILE IAD" for all public-use airports. See AIM, Basic Flight Information and ATC Procedures for detailed descriptions of NOTAM.

③ LOCATION IDENTIFIER

A three or four character code assigned to airports. These identifiers are used by ATC in lieu of the airport name in flight plans, flight strips and other written records and computer operations.

④ AIRPORT LOCATION

Airport location is expressed as distance and direction from the center of the associated city in nautical miles and cardinal points, i.e., 4 NE.

⑤ TIME CONVERSION

Hours of operation of all facilities are expressed in Greenwich Mean Time (GMT) and shown as "Z" time. The directory indicates the number of hours to be subtracted from GMT to obtain local standard time and local daylight saving time GMT-5(-4DT). The symbol ‡ indicates that during periods of Daylight Saving Time effective hours will be one hour earlier than shown. In those areas where daylight saving time is not observed that (-4DT) and ‡ will not be shown. All states observe daylight savings time except Arizona and that portion of Indiana in the Eastern Time Zone and Puerto Rico and the Virgin Islands.

⑥ GEOGRAPHIC POSITION OF AIRPORT

⑦ CHARTS

The Sectional Chart and Low and High Altitude Enroute Chart and panel on which the airport or facility is located.

⑧ INSTRUMENT APPROACH PROCEDURES

IAP indicates an airport for which a prescribed (Public Use) FAA Instrument Approach Procedure has been published.

⑨ ELEVATION

Elevation is given in feet above mean sea level and is the highest point on the landing surface. When elevation is sea level it will be indicated as (00). When elevation is below sea level a minus (-) sign will precede the figure.

⑩ ROTATING LIGHT BEACON

B indicates rotating beacon is available. Rotating beacons operate dusk to dawn unless otherwise indicated in AIRPORT REMARKS.

⑪ SERVICING

S1: Minor airframe repairs.
S2: Minor airframe and minor powerplant repairs.
S3: Major airframe and minor powerplant repairs.
S4: Major airframe and major powerplant repairs.

DIRECTORY LEGEND

⑫ FUEL

CODE	FUEL
80	Grade 80 gasoline (Red)
100	Grade 100 gasoline (Green)
100LL	Grade 100LL gasoline (low lead) (Blue)
115	Grade 115 gasoline
A	Jet A - Kerosene freeze point -40° C
A1	Jet A 1 — Kerosene, freeze point -50° C
A1 +	Jet A 1 — Kerosene with icing inhibitor, freeze point -50° C
B	Jet B — Wide cut turbine fuel, freeze point -50° C
B +	Jet B — Wide cut turbine fuel with icing inhibitor, freeze point -50° C

⑬ OXYGEN

OX 1	High Pressure
OX 2	Low Pressure
OX 3	High Pressure — Replacement Bottles
OX 4	Low Pressure — Replacement Bottles

⑭ TRAFFIC PATTERN ALTITUDE

Traffic Pattern Altitude (TPA) — The first figure shown is TPA above mean sea level. The second figure in parentheses is TPA above airport elevation.

⑮ AIRPORT OF ENTRY AND LANDING RIGHTS AIRPORTS

AOE — Airport of Entry — A customs Airport of Entry where permission from U.S. Customs is not required, however, at least one hour advance notice of arrival must be furnished.

LRA — Landing Rights Airport — Application for permission to land must be submitted in advance to U.S. Customs. At least one hour advance notice of arrival must be furnished.

NOTE: Advance notice of arrival at both an AOE and LRA airport may be included in the flight plan when filed in Canada or Mexico, where Flight Notification Service (ADCUS) is available the airport remark will indicate this service. This notice will also be treated as an application for permission to land in the case of an LRA. Although advance notice of arrival may be relayed to Customs through Mexico, Canadian, and U.S. Communications facilities by flight plan, the aircraft operator is solely responsible for insuring that Customs receives the notification. (See Customs, Immigration and Naturalization, Public Health and Agriculture Department requirements in the International Flight Information Manual for further details.)

⑯ CERTIFICATED AIRPORT (FAR 139)

Airports serving Civil Aeronautics Board certified carriers and certified under FAR, Part 139, are indicated by the CFR index; i.e., CFR Index A, which relates to the availability of crash, fire, rescue equipment.

FAR–PART 139 CERTIFICATED AIRPORTS

INDICES AND FIRE FIGHTING AND RESCUE EQUIPMENT REQUIREMENTS

Airport Index	*Required No Vehicles*	*Aircraft Length*	*Scheduled Departures*	*Agent + Water for Foam*
A	1	· 90′	·1	500#DC or 450#DC + 50 gal H_2O
AA	1	> 90′, · 126′	5	300#DC + 500 gal H_2O
B	2	> 90′, · 126′	·5	Index A + 1500 gal H_2O
		> 126′, · 160′	5	
C	3	> 126′, · 160′	·5	Index A + 3000 gal H_2O
		> 160′, · 200′	· 5	
D	3	> 160′, · 200′ > 200′	·5 · 5	Index A + 4000 gal H_2O
E	3	> 200′	·5	Index A + 6000 gal H_2O

> Greater Than; < Less Than; ≥ Equal or Greater Than; · Equal or Less Than; H_2O–Water; DC–Dry Chemical.

NOTE: If AFFF (Aqueous Film Forming Foam) is used in lieu of Protein Foam, the water quantities listed for Indices AA thru E can be reduced 33⅓%. See FAR Part 139.49 for full details. The listing of CFR index does not necessarily assure coverage for non-air carrier operations or at other than prescribed times for air carrier. CFR index Ltd. — indicates CFR coverage may or may not be available, for information contact airport manager prior to flight.

DIRECTORY LEGEND

⑰ FAA INSPECTION

All airports not inspected by FAA will be identified by the note Not insp This indicates that the airport information has been provided by the owner or operator of the field

⑱ RUNWAY DATA

Runway information is shown on two lines That information common to the entire runway is shown on the first line while information concerning the runway ends are shown on the second or following line Lengthy information will be placed in the Airport Remarks

Runway direction, surface, length, width, weight bearing capacity, lighting, gradient (when gradient exceeds 0.3 percent) and appropriate remarks are shown for each runway Direction, length, width, lighting and remarks are shown for sealanes The full dimensions of helipads are shown, i e , 50X150

RUNWAY SURFACE AND LENGTH

Runway lengths prefixed by the letter "H" indicate that the runways are hard surfaced (concrete, asphalt). If the runway length is not prefixed, the surface is sod, clay, etc The runway surface composition is indicated in parentheses after runway length as follows

(AFSC)—Aggregate friction seal coat
(ASPH)—Asphalt
(CONC)—Concrete
(DIRT)—Dirt
(GRVD)—Grooved
(GRVL)—Gravel, or cinders
(PFC)—Porous friction courses
(RFSC)—Rubberized friction seal coat
(TURF)—Turf
(TRTD)—Treated
(WC)—Wire combed

RUNWAY WEIGHT BEARING CAPACITY

Runway strength data shown in this publication is derived from available information and is a realistic estimate of capability at an average level of activity It is not intended as a maximum allowable weight or as an operating limitation Many airport pavements are capable of supporting limited operations with gross weights of 25-50% in excess of the published figures Permissible operating weights, insofar as runway strengths are concerned, are a matter of agreement between the owner and user When desiring to operate into any airport at weights in excess of those published in the publication, users should contact the airport management for permission Add 000 to figure following S, D, DT, DDT and MAX for gross weight capacity

S—Runway weight bearing capacity for aircraft with single- wheel type landing gear, (DC-3), etc
D—Runway weight bearing capacity for aircraft with dual-wheel type landing gear, (DC-6), etc
DT—Runway weight bearing capacity for aircraft with dual-tandem type landing gear, (707), etc
DDT—Runway weight bearing capacity for aircraft with double dual- tandem type landing gear, (747), etc

Quadricycle and dual-tandem are considered virtually equal for runway weight bearing consideration, as are single-tandem and dual-wheel

Omission of weight bearing capacity indicates information unknown

RUNWAY LIGHTING

Lights are in operation sunset to sunrise Lighting available by prior arrangement only or operating part of the night only and/or pilot controlled and with specific operating hours are indicated under airport remarks Since obstructions are usually lighted, obstruction lighting is not included in this code Unlighted obstructions on or surrounding an airport will be noted in airport remarks

Temporary, emergency or limited runway edge lighting such as flares, smudge pots, lanterns or portable runway lights will also be shown in airport remarks

Types of lighting are shown with the runway or runway end they serve

LIRL—Low Intensity Runway Lights
MIRL—Medium Intensity Runway Lights
HIRL—High Intensity Runway Lights
REIL—Runway End Identifier Lights
CL—Centerline Lights
TDZ—Touchdown Zone Lights
ODALS—Omni Directional Approach Lighting System
AF OVRN—Air Force Overrun 1000′ Standard Approach Lighting System
LDIN—Lead-In Lighting System
MALS—Medium Intensity Approach Lighting System
MALSF—Medium Intensity Approach Lighting System with Sequenced Flashing Lights
MALSR—Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
SALS—Short Approach Lighting System.
SALSF—Short Approach Lighting System with Sequenced Flashing Lights.
SSALS—Simplified Short Approach Lighting System.
SSALF—Simplified Short Approach Lighting System with Sequenced Flashing Lights.
SSALR—Simplified Short Approach Lighting System with Runway Alignment Indicator Lights.
ALSAF—High Intensity Approach Lighting System with Sequenced Flashing Lights
ALSF1—High Intensity Approach Lighting System with Sequenced Flashing Lights, Category I, Configuration.
ALSF2—High Intensity Approach Lighting System with Sequenced Flashing Lights, Category II, Configuration.
VASI—Visual Approach Slope Indicator System.

VISUAL APPROACH SLOPE INDICATOR SYSTEMS

VASI—Visual Approach Slope Indicator
SAVASI—Simplified Abbreviated Visual Approach Slope Indicator

DIRECTORY LEGEND

S2L	2-box SAVASI on left side of runway
S2R	2-box SAVASI on right side of runway
V2R	2-box VASI on right side of runway
V2L	2-box VASI on left side of runway
V4R	4-box VASI on right side of runway
V4L	4-box VASI on left side of runway
V6R	6-box VASI on right side of runway
V6L	6-box VASI on left side of runway
V12	12-box VASI on both sides of runway
V16	16-box VASI on both sides of runway
*NSTD	Nonstandard VASI, VAPI, or any other system not listed above

VASI approach slope angle and threshold crossing height will be shown when available; i.e., GA 3.5° TCH 37.0'

PILOT CONTROL OF AIRPORT LIGHTING

Key Mike	Function
7 times within 5 seconds	Highest intensity available
5 times within 5 seconds	Medium or lower intensity (Lower REIL or REIL-Off)
3 times within 5 seconds	Lowest intensity available (Lower REIL or REIL-Off)

Available systems will be indicated in the Airport Remarks, as follows

ACTIVATE MALSR Rwy 7, HIRL Rwy 7-25-122.8
or
ACTIVATE MIRL Rwy 18-36-122.8
or
ACTIVATE VASI and REIL, Rwy 7-122.8

Where the airport is not served by an instrument approach procedure and/or has an independent type system of different specification installed by the airport sponsor, descriptions of the type lights, method of control, and operating frequency will be explained in clear text. See AIM, "Basic Flight Information and ATC Procedures," for detailed description of pilot control of airport lighting.

RUNWAY GRADIENT

Runway gradient will be shown only when it is 0.3 percent or more. When available the direction of slope upward will be indicated, i.e., 0.5% up NW

RUNWAY END DATA

Lighting systems such as VASI, MALSR, REIL; obstructions; displaced thresholds will be shown on the specific runway end. "Rgt tfc"—Right traffic indicates right turns should be made on landing and takeoff for specified runway end

⑲ AIRPORT REMARKS

Landing Fee indicates landing charges for private or non-revenue producing aircraft, in addition, fees may be charged for planes that remain over a couple of hours and buy no services, or at major airline terminals for all aircraft

Remarks—Data is confined to operational items affecting the status and usability of the airport.

⑳ WEATHER DATA SOURCES

AWOS—Automated Weather Observation System

AWOS-1—reports altimeter setting, wind data and usually temperature, dewpoint and density altitude.
AWOS-2—reports the same as AWOS-1 plus visibility.
AWOS-3—reports the same as AWOS-1 plus visibility and cloud/ceiling data.
See AIM, Basic Flight Information and ATC Procedures for detailed description of AWOS.

SAWRS—identifies airports that have a Supplemental Aviation Weather Reporting Station available to pilots for current weather information.

LLWAS—indicates a Low Level Wind Shear Alert System consisting of a center field and several field perimeter anemometers.

DIRECTORY LEGEND

㉑ COMMUNICATIONS

Communications will be listed in sequence in the order shown below

Common Traffic Advisory Frequency (CTAF), Automatic Terminal Information Service (ATIS) and Aeronautical Advisory Stations (UNICOM) along with their frequency is shown, where available, on the line following the heading "COMMUNICATIONS." When the CTAF and UNICOM is the same frequency, the frequency will be shown as CTAF/UNICOM freq

Flight Service Station (FSS) information The associated FSS will be shown followed by the identifier and information concerning availability of telephone service, e g , Direct Line (DL), Local Call (LC-384-2341), Long Distance (LD 202-426-8800 or LD 1-202-555-1212) etc The airport NOTAM file identifier will be shown as "NOTAM FILE IAD." Where the FSS is located on the field it will be indicated as "on arpt" following the identifier Frequencies available will follow The FSS telephone number will follow along with any significant operational information FSS's whose name is not the same as the airport on which located will also be listed in the normal alphabetical name listing for the state in which located Remote Communications Outlet (RCO) providing service to the airport followed by the frequency and name of the Controlling FSS

FSS's provide information on airport conditions, radio aids and other facilities, and process flight plans Airport Advisory Service is provided on the CTAF by FSS's located at non-tower airports or airports where the tower is not in operation

(See AIM, Par 157/158 Traffic Advisory Practices at airports where a tower is not in operation or AC 90 - 42C.)

Aviation weather briefing service is provided by FSS specialists Flight and weather briefing services are also available by calling the telephone numbers listed

Remote Communications Outlet (RCO)—An unmanned air/ ground communications facility, remotely controlled and providing UHF or VHF communications capability to extend the service range of an FSS

Civil Communications Frequencies—Civil communications frequencies used in the FSS air/ground system are now operated simplex on 122 0, 122 2, 122 3, 122 4, 122 6, 123 6, emergency 121 5, plus receive-only on 122 05, 122 1, 122 15, and 123 6

- a 122 0 is assigned as the Enroute Flight Advisory Service channel at selected FSS's
- b 122 2 is assigned to all FSS's as a common enroute simplex service
- c 123 6 is assigned as the airport advisory channel at non-tower FSS locations, however, it is still in commission at some FSS's collocated with towers to provide part time Airport Advisory Service
- d 122 1 is the primary receive-only frequency at VOR's 122 05, 122 15 and 123 6 are assigned at selected VOR's meeting certain criteria
- e Some FSS's are assigned 50 kHz channels for simplex operation in the 122-123 MHz band (e g 122 35) Pilots using the FSS A/G system should refer to this directory or appropriate charts to determine frequencies available at the FSS or remoted facility through which they wish to communicate

Part time FSS hours of operation are shown in remarks under facility name

Emergency frequency 121 5 is available at all Flight Service Stations, Towers, Approach Control and RADAR facilities, unless indicated as not available

Frequencies published followed by the letter "T" or "R", indicate that the facility will only transmit or receive respectively on that frequency All radio aids to navigation frequencies are transmit only

TERMINAL SERVICES

CTAF—A program designed to get all vehicles and aircraft at uncontrolled airports on a common frequency

ATIS—A continuous broadcast of recorded non-control information in selected areas of high activity

UNICOM—A non government air/ground radio communications facility utilized to provide general airport advisory service

APP CON—Approach Control The symbol Ⓡ indicates radar approach control

TOWER—Control tower

GND CON—Ground Control

DEP CON—Departure Control The symbol Ⓡ indicates radar departure control

CLNC DEL—Clearance Delivery

PRE TAXI CLNC—Pre taxi clearance

VFR ADVSY SVC—VFR Advisory Service Service provided by Non Radar Approach Control Advisory Service for VFR aircraft (upon a workload basis) ctc APP CON

STAGE II SVC—Radar Advisory and Sequencing Service for VFR aircraft

STAGE III SVC—Radar Sequencing and Separation Service for participating VFR Aircraft within a Terminal Radar Service Area (TRSA)

ARSA—Airport Radar Service Area

TCA—Radar Sequencing and Separation Service for all aircraft in a Terminal Control Area (TCA)

TOWER, APP CON and DEP CON RADIO CALL will be the same as the airport name unless indicated otherwise

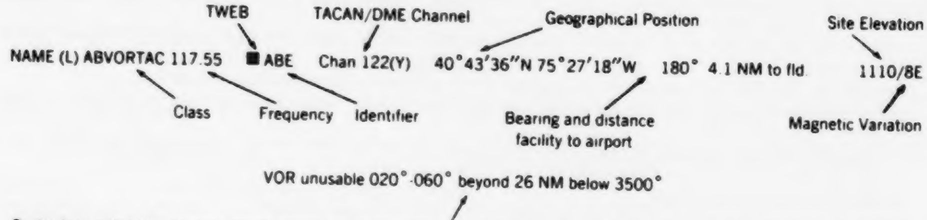
DIRECTORY LEGEND

㉒ RADIO AIDS TO NAVIGATION

The Airport Facility Directory lists by facility name all Radio Aids to Navigation, except Military TACANS, that appear on National Ocean Service Visual or IFR Aeronautical Charts and those upon which the FAA has approved an Instrument Approach Procedure.

All VOR, VORTAC ILS and MLS equipment in the National Airspace System has an automatic monitoring and shutdown feature in the event of malfunction. Unmonitored, as used in this publication for any navigational aid, means that FSS or tower personnel cannot observe the malfunction or shutdown signal. The NAVAID NOTAM file identifier will be shown as "NOTAM FILE IAD" and will be listed on the Radio Aids to Navigation line. When two or more NAVAIDS are listed and the NOTAM file identifier is different than shown on the Radio Aids to Navigation line, then it will be shown with the NAVAID listing.

NAVAID information is tabulated as indicated in the following sample:


TWEB
TACAN/DME Channel
Geographical Position
Site Elevation
NAME (L) ABVORTAC 117.55 ■ ABE Chan 122(Y) 40°43'36"N 75°27'18"W 180° 4.1 NM to fld. 1110/8E
Class
Frequency
Identifier
Bearing and distance facility to airport
Magnetic Variation
VOR unusable 020°-060° beyond 26 NM below 3500°

Restriction within the normal altitude/range of the navigational aid (See primary alphabetical listing for restrictions on VORTAC and VOR/DME).

Note: Those DME channel numbers with a (Y) suffix require TACAN to be placed in the "Y" mode to receive distance information.

ASR/PAR—Indicates that Surveillance (ASR) or Precision (PAR) radar instrument approach minimums are published in U.S. Government Instrument Approach Procedures.

RADIO CLASS DESIGNATIONS

Identification of VOR/VORTAC/TACAN Stations by Class (Operational Limitations):

Normal Usable Altitudes and Radius Distances

Class	Altitudes	Distance (miles)
(T)	12,000' and below	25
(L)	Below 18,000'	40
(H)	Below 18,000'	40
(H)	Within the Conterminous 48 States only, between 14,500' and 17,999'	100
(H)	18,000' FL 450	130
(H)	Above FL 450	100

(H) = High (L) = Low (T) = Terminal

NOTE: An (H) facility is capable of providing (L) and (T) service volume and an (L) facility additionally provides (T) service volume.

The term VOR is, operationally, a general term covering the VHF omnidirectional bearing type of facility without regard to the fact that the power, the frequency protected service volume, the equipment configuration, and operational requirements may vary between facilities at different locations.

AB	Automatic Weather Broadcast (also shown with ■ following frequency.)
DF	Direction Finding Service.
DME	UHF standard (TACAN compatible) distance measuring equipment.
DME(Y)	UHF standard (TACAN compatible) distance measuring equipment that require TACAN to be placed in the "Y" mode to receive DME.
H	Non-directional radio beacon (homing), power 50 watts to less than 2,000 watts (50 NM at all altitudes).
HH	Non-directional radio beacon (homing), power 2,000 watts or more (75 NM at all altitudes).
H-SAB	Non-directional radio beacons providing automatic transcribed weather service.
ILS	Instrument Landing System (voice, where available, on localizer channel).
ISMLS	Interim Standard Microwave Landing System.
LDA	Localizer Directional Aid.
LMM	Compass locator station when installed at middle marker site (15 NM at all altitudes).
LOM	Compass locator station when installed at outer marker site (15 NM at all altitudes).
MH	Non-directional radio beacon (homing) power less than 50 watts (25 NM at all altitudes).
MLS	Microwave Landing System

DIRECTORY LEGEND

S	Simultaneous range homing signal and/or voice
SABH	Non-directional radio beacon not authorized for IFR or ATC. Provides automatic weather broadcasts
SDF	Simplified Direction Facility
TACAN	UHF navigational facility omnidirectional course and distance information
VOR	VHF navigational facility omnidirectional course only
VOR DME	Collocated VOR navigational facility and UHF standard distance measuring equipment
VORTAC	Collocated VOR and TACAN navigational facilities
W	Without voice on radio facility frequency
Z	VHF station location marker at a LF radio facility

FREQUENCY PAIRING PLAN AND MLS CHANNELING

MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL	MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL	MLS CHANNEL	VHF FREQUENCY	TACAN CHANNEL
500	108 10	18X	568	109 45	31Y	634	114 05	87Y
502	108 30	20X	570	109 55	32Y	636	114 15	88Y
504	108 50	22X	572	109 65	33Y	638	114 25	89Y
506	108 70	24X	574	109 75	34Y	640	114 35	90Y
508	108 90	26X	576	109 85	35Y	642	114 45	91Y
510	109 10	28X	578	109 95	36Y	644	114 55	92Y
512	109 30	30X	580	110 05	37Y	646	114 65	93Y
514	109 50	32X	582	110 15	38Y	648	114 75	94Y
516	109 70	34X	584	110 25	39Y	650	114 85	95Y
518	109 90	36X	586	110 35	40Y	652	114 95	96Y
520	110 10	38X	588	110 45	41Y	654	115 05	97Y
522	110 30	40X	590	110 55	42Y	656	115 15	98Y
524	110 50	42X	592	110 65	43Y	658	115 25	99Y
526	110 70	44X	594	110 75	44Y	660	115 35	100Y
528	110 90	46X	596	110 85	45Y	662	115 45	101Y
530	111 10	48X	598	110 95	46Y	664	115 55	102Y
532	111 30	50X	600	111 05	47Y	666	115 65	103Y
534	111 50	52X	602	111 15	48Y	668	115 75	104Y
536	111 70	54X	604	111 25	49Y	670	115 85	105Y
538	111 90	56X	606	111 35	50Y	672	115 95	106Y
540	108 05	17Y	608	111 45	51Y	674	116 05	107Y
542	108 15	18Y	610	111 55	52Y	676	116 15	108Y
544	108 25	19Y	612	111 65	53Y	678	116 25	109Y
546	108 35	20Y	614	111 75	54Y	680	116 35	110Y
548	108 45	21Y	616	111 85	55Y	682	116 45	111Y
550	108 55	22Y	618	111 95	56Y	684	116 55	112Y
552	108 65	23Y	620	113 35	80Y	686	116 65	113Y
554	108 75	24Y	622	113 45	81Y	688	116 75	114Y
556	108 85	25Y	624	113 55	82Y	690	116 85	115Y
558	108 95	26Y	626	113 65	83Y	692	116 95	116Y
560	109 05	27Y	628	113 75	84Y	694	117 05	117Y
562	109 15	28Y	630	113 85	85Y	696	117 15	118Y
564	109 25	29Y	632	113 95	86Y	698	117 25	119Y
566	109 35	30Y						

APPENDIX 3

ABBREVIATIONS

The abbreviations listed below are used to identify the aircraft associated with each test question listed in Appendix 1.

ALL — All Aircraft
AIR — Airplanes
RTC — Rotorcraft*
HLC — Helicopters
GYR — Gyroplanes
PWR — Powered Aircraft*
GLI — Gliders
HBL — Hot Air Balloons
GBL — Gas Balloons
ARS — Airships

*RTC applies to both helicopters and gyroplanes.
PWR applies to airplanes, rotorcraft, and airships.

GOVERNMENT PUBLICATIONS

The following is a list of government publications which should be useful when preparing for the written examinations contained in this book:

Aeronautical Charts
Airman's Information Manual
Airport/Facility Directory
Notices to Airmen (Class II)
Federal Aviation Regulations
VFR Pilot Exam-O-Grams
National Transportation Safety Board Regulations
AC 00-6, Aviation Weather
AC 00-45, Aviation Weather Services
AC 00-50, Low Level Wind Shear
AC 20-32, Carbon Monoxide Contamination in Aircraft
AC 61-13, Basic Helicopter Handbook
AC 61-21, Flight Training Handbook
AC 61-23, Pilot's Handbook of Aeronautical Knowledge
AC 67-2, Medical Handbook for Pilots
AC 90-48, Pilot's Role in Collision Avoidance
AC 91-13, Cold Weather Operating of Aircraft
AC 91-23, Pilot's Weight and Balance Handbook
AC 91-33, Use of Alternate Grade of Aviation Gasoline

AC 00-2, Advisory Circular Checklist, explains how to obtain the above mentioned advisory circulars. You may request to be placed on the mailing list from the following office:

U.S. Department of Transportation
Distribution Requirements Section, M-494.1
Washington, D.C. 20590

FAA-APA-PG-7, Guide to Federal Aviation Administration Publications, is another useful phamplet containing all FAA publications and may be ordered from the following office:

Administration Publications
U.S. Department of Transportation
Subsequent Distribution Unit, M-494.3
Washington, D.C. 20590

Other sources of instructional material produced commercially may be obtained from various bookstores or fixed-base operators engaged in flight training. For subject areas where government publications have limited study material for certain categories of aircraft, commercially produced publications may be desirable.

AIRCRAFT CATEGORIES

To determine the applicable aircraft category for each question, refer to the question number in the following list.

Item	*Aircraft*
1001.	ALL
1002.	ALL
1003.	ALL
1004.	ALL
1005.	PWR, GLI
1006.	AIR, GYR
1007.	ALL
1008.	PWR
1009.	PWR, GLI
1010.	PWR, GLI
1011.	ALL
1012.	ALL
1013.	ALL
1014.	PWR, GLI
1015.	ALL
1016.	ALL
1017.	PWR
1018.	PWR
1019.	PWR
1020.	PWR
1021.	PWR
1022.	PWR
1023.	PWR
1024.	PWR, GLI
1025.	PWR
1026.	AIR, RTC
1027.	AIR, GYR, ARS
1028.	ALL
1029.	PWR, GLI
1030.	AIR, GYR
1031.	AIR, GYR
1032.	AIR, GYR
1033.	AIR, GYR
1034.	AIR, GYR
1035.	AIR, GYR
1036.	AIR
1037.	AIR
1038.	AIR
1039.	AIR
1040.	AIR
1041.	HLC
1042.	HLC
1043.	HLC
1044.	HLC
1045.	GLI
1046.	GLI
1047.	GLI
1048.	GLI
1049.	GLI
1050.	GYR
1051.	AIR
1052.	AIR
1053.	AIR
1054.	AIR
1055.	AIR
1056.	AIR
1057.	AIR
1058.	AIR
1059.	AIR
1060.	GYR
1061.	GYR
1062.	GYR
1063.	GYR
1064.	GYR
1065.	AIR
1066.	AIR
1067.	AIR
1068.	AIR
1069.	ARS
1070.	ARS
1071.	ARS
1072.	AIR
1073.	PWR
1074.	PWR
1075.	AIR
1076.	PWR
1077.	PWR
1078.	AIR
1079.	PWR
1080.	PWR
1081.	PWR
1082.	PWR
1083.	PWR
1084.	PWR
1085.	PWR
1086.	HBL
1087.	HBL
1088.	PWR
1089.	PWR
1090.	AIR, GYR
1091.	PWR
1092.	PWR
1093.	PWR
1094.	PWR
1095.	PWR
1096.	HBL
1097.	HBL
1098.	HBL
1099.	PWR
1100.	PWR
1101.	AIR
1102.	HLC
1103.	HLC
1104.	HLC
1105.	AIR, RTC
1106.	AIR, RTC
1107.	AIR, RTC
1108.	PWR
1109.	PWR, GLI
1110.	PWR
1111.	GLI
1112.	PWR, GLI
1113.	PWR, GLI
1114.	PWR, GLI
1115.	PWR, GLI
1116.	GLI
1117.	GLI
1118.	PWR, GLI
1119.	ALL
1120.	AIR
1121.	AIR, GLI
1122.	AIR, GLI
1123.	PWR, GLI
1124.	AIR
1125.	AIR, RTC, GLI
1126.	AIR
1127.	AIR
1128.	AIR
1129.	AIR
1130.	AIR
1131.	ALL
1132.	ALL
1133.	ALL
1134.	ALL
1135.	AIR
1136.	PWR, GLI
1137.	PWR, GLI
1138.	PWR, GLI
1139.	PWR
1140.	ARS
1141.	ARS
1142.	ARS
1143.	ARS
1144.	ARS
1145.	ARS
1146.	ARS
1147.	ARS
1148.	ARS
1149.	ARS
1150.	HBL
1151.	HBL, GBL
1152.	HBL

Item	*Aircraft*
1153.	GBL
1154.	GBL
1155.	GLI
1156.	GLI
1157.	GLI
1158.	GLI
1159.	GLI
1160.	GLI
1161.	GLI
1162.	AIR
1163.	AIR
1164.	AIR
1165.	AIR
1166.	AIR, RTC, GLI
1167.	AIR
1168.	HBL, GBL
1169.	AIR
1170.	AIR
1171.	AIR
1172.	AIR
1173.	AIR
1174.	AIR, GLI
1175.	AIR
1176.	AIR, GLI
1177.	AIR
1178.	AIR
1179.	AIR
1180.	AIR
1181.	AIR
1182.	AIR
1183.	AIR
1184.	AIR
1185.	AIR
1186.	AIR
1187.	AIR
1188.	AIR
1189.	AIR
1190.	AIR
1191.	AIR
1192.	AIR
1193.	AIR, GYR
1194.	AIR
1195.	AIR
1196.	RTC
1197.	RTC
1198.	GYR
1199.	GYR
1200.	HLC
1201.	HLC
1202.	RTC
1203.	HLC
1204.	HLC
1205.	RTC
1206.	GYR
1207.	HLC
1208.	RTC
1209.	AIR
1210.	AIR
1211.	PWR
1212.	GLI
1213.	GLI
1214.	GYR
1215.	HLC
1216.	AIR
1217.	AIR
1218.	AIR
1219.	AIR
1220.	AIR
1221.	HLC
1222.	HLC
1223.	HLC
1224.	HLC
1225.	HLC
1226.	HLC
1227.	HLC
1228.	HBL
1229.	HBL
1230.	HBL
1231.	HBL
1232.	HBL
1233.	HBL
1234.	HLC
1235.	AIR
1236.	AIR
1237.	AIR
1238.	AIR
1239.	AIR
1240.	AIR
1241.	AIR
1242.	AIR
1243.	GLI
1244.	GLI
1245.	GLI
1246.	GYR
1247.	GYR
1248.	GYR
1249.	ALL
1250.	ALL
1251.	ALL
1252.	ALL
1253.	ALL
1254.	ALL
1255.	AIR
1256.	AIR
1257.	AIR
1258.	AIR
1259.	AIR
1260.	AIR
1261.	AIR
1262.	GYR
1263.	GYR
1264.	HLC
1265.	HLC
1266.	PWR
1267.	PWR
1268.	ALL
1269.	PWR
1270.	ALL
1271.	ALL
1272.	GLI
1273.	HBL, GBL
1274.	PWR
1275.	PWR
1276.	GLI
1277.	ALL
1278.	PWR
1279.	ALL
1280.	ALL
1281.	PWR
1282.	PWR
1283.	ALL
1284.	HBL, GBL
1285.	ALL
1286.	GLI
1287.	ALL
1288.	PWR
1289.	ALL
1290.	AIR, RTC
1291.	AIR, RTC
1292.	AIR, RTC
1293.	PWR
1294.	PWR
1295.	PWR
1296.	ALL
1297.	HBL, GBL
1298.	ARS
1299.	ALL
1300.	PWR
1301.	PWR
1302.	ALL
1303.	ALL
1304.	ALL
1305.	ALL
1306.	GLI
1307.	HBL, GBL
1308.	HBL, GBL
1309.	PWR
1310.	PWR
1311.	AIR, RTC
1312.	AIR, RTC
1313.	AIR, RTC
1314.	AIR, RTC
1315.	AIR, RTC
1316.	AIR, RTC
1317.	PWR
1318.	ALL
1319.	ALL
1320.	AIR, RTC

Item	*Aircraft*
1321.	AIR, RTC
1322.	AIR, RTC
1323.	AIR, RTC
1324.	AIR, RTC
1325.	PWR
1326.	ALL
1327.	ALL
1328.	PWR
1329.	PWR
1330.	PWR
1331.	AIR, RTC
1332.	GLI
1333.	GLI
1334.	ALL
1335.	ALL
1336.	ALL
1337.	ARS
1338.	ARS
1339.	ARS
1340.	PWR
1341.	PWR
1342.	PWR
1343.	PWR
1344.	PWR
1345.	PWR
1346.	PWR
1347.	HLC
1348.	PWR
1349.	AIR
1350.	AIR
1351.	PWR
1352.	HBL
1353.	HBL
1354.	HBL
1355.	HBL, GBL
1356.	AIR, ARS
1357.	AIR, ARS
1358.	AIR, ARS
1359.	HBL, GBL
1360.	AIR
1361.	HLC
1362.	HLC
1363.	HLC
1364.	HLC
1365.	HLC
1366.	HLC
1367.	HLC
1368.	HLC
1369.	HLC
1370.	GLI
1371.	GLI
1372.	GLI
1373.	GLI
1374.	GLI
1375.	GLI
1376.	GLI
1377.	GLI
1378.	GLI
1379.	GLI
1380.	GLI
1381.	GLI
1382.	GLI
1383.	GLI
1384.	GLI
1385.	GLI
1386.	GLI
1387.	HBL
1388.	HBL, GBL
1389.	HBL, GBL
1390.	HBL
1391.	HBL
1392.	HBL
1393.	HBL
1394.	HBL
1395.	HBL
1396.	HBL
1397.	HBL
1398.	HBL
1399.	HBL
1400.	HBL
1401.	HBL
1402.	ARS
1403.	ARS
1404.	ARS
1405.	PWR
1406.	PWR
1407.	PWR
1408.	AIR, GYR
1409.	AIR, GYR
1410.	AIR, RTC, GLI
1411.	AIR, RTC, GLI
1412.	AIR
1413.	AIR
1414.	AIR, RTC, GLI
1415.	AIR, GYR, ARS
1416.	AIR, GYR, ARS
1417.	AIR, GYR
1418.	HLC
1419.	GLI
1420.	ARS
1421.	AIR, GYR, GLI
1422.	AIR, GYR, GLI
1423.	AIR, GYR, GLI
1424.	AIR, GYR, GLI
1425.	ALL
1426.	HLC
1427.	AIR, GYR
1428.	AIR, GYR
1429.	AIR, GYR
1430.	AIR, GYR
1431.	AIR, GYR
1432.	AIR, GYR
1433.	AIR, GYR
1434.	AIR, GYR
1435.	AIR, GYR
1436.	AIR, GYR
1437.	AIR, GYR
1438.	AIR, GYR, GLI
1439.	AIR, GYR, GLI
1440.	AIR, GYR, GLI
1441.	AIR, GYR
1442.	AIR, GYR, GLI
1443.	AIR, GYR, GLI
1444.	HBL, GBL
1445.	ALL
1446.	ALL
1447.	ALL
1448.	ALL
1449.	PWR
1450.	PWR
1451.	PWR
1452.	PWR
1453.	PWR
1454.	PWR
1455.	AIR, HLC
1456.	ALL
1457.	ALL
1458.	ALL
1459.	HLC
1460.	PWR
1461.	PWR
1462.	AIR, GYR
1463.	AIR, GYR
1464.	PWR
1465.	AIR
1466.	AIR
1467.	AIR
1468.	AIR
1469.	PWR
1470.	AIR, RTC
1471.	AIR
1472.	AIR
1473.	AIR
1474.	PWR
1475.	PWR
1476.	AIR, GYR
1477.	PWR
1478.	PWR
1479.	PWR, GLI
1480.	PWR
1481.	PWR, GLI
1482.	PWR, GLI
1483.	AIR
1484.	PWR
1485.	PWR
1486.	PWR
1487.	PWR
1488.	PWR

Item	*Aircraft*
1489.	PWR
1490.	PWR
1491.	PWR
1492.	PWR
1493.	ALL
1494.	AIR, GYR
1495.	PWR
1496.	AIR, GYR
1497.	ALL
1498.	ALL
1499.	ALL
1500.	ALL
1501.	ALL
1502.	ALL
1503.	ALL
1504.	ALL
1505.	HBL, GBL
1506.	ALL
1507.	HBL, GBL
1508.	PWR
1509.	ALL
1510.	ALL
1511.	PWR
1512.	AIR
1513.	ALL
1514.	AIR, RTC
1515.	ALL
1516.	AIR
1517.	ALL
1518.	ALL
1519.	HBL, GBL
1520.	GLI
1521.	ALL
1522.	ALL
1523.	ALL
1524.	ALL
1525.	ALL
1526.	ALL
1527.	HBL, GBL
1528.	ALL
1529.	AIR, GYR, GLI
1530.	PWR
1531.	AIR
1532.	ALL
1533.	ALL
1534.	ALL
1535.	HBL, GBL
1536.	GLI
1537.	AIR
1538.	GLI
1539.	AIR, RTC, GLI
1540.	AIR, GLI
1541.	HBL, ARS
1542.	HBL, GBL
1543.	GLI
1544.	GLI
1545.	GLI
1546.	RTC
1547.	GLI
1548.	RTC
1549.	AIR
1550.	AIR
1551.	HLC
1552.	AIR
1553.	PWR
1554.	ALL
1555.	ALL
1556.	AIR
1557.	ALL
1558.	GLI
1559.	ALL
1560.	AIR
1561.	AIR, ARS
1562.	AIR
1563.	PWR, GLI
1564.	PWR
1565.	AIR, GLI
1566.	ALL
1567.	ALL
1568.	AIR, RTC
1569.	AIR, RTC
1570.	AIR, RTC
1571.	AIR, GLI
1572.	AIR, GLI
1573.	AIR, GLI
1574.	AIR, GLI
1575.	ALL
1576.	ALL
1577.	ALL
1578.	ALL
1579.	ALL
1580.	ALL
1581.	AIR, RTC, GLI
1582.	HLC
1583.	HLC
1584.	AIR
1585.	AIR, RTC, GLI
1586.	AIR, RTC, GLI
1587.	AIR, RTC
1588.	AIR, RTC
1589.	AIR, RTC
1590.	AIR
1591.	ALL
1592.	ALL
1593.	ALL
1594.	ALL
1595.	ALL
1596.	ALL
1597.	HLC
1598.	PWR, GLI
1599.	ALL
1600.	ALL
1601.	ALL
1602.	ALL
1603.	ALL
1604.	ALL
1605.	ALL
1606.	ALL
1607.	ALL
1608.	ALL
1609.	ALL
1610.	ALL
1611.	ALL
1612.	ALL
1613.	ALL
1614.	ALL
1615.	ALL
1616.	AIR, GYR, ARS
1617.	AIR
1618.	AIR
1619.	AIR
1620.	HLC
1621.	PWR
1622.	PWR
1623.	PWR
1624.	ALL
1625.	ALL
1626.	ALL
1627.	ALL
1628.	ALL
1629.	ALL
1630.	ALL
1631.	ALL
1632.	ALL
1633.	ALL
1634.	ALL
1635.	ALL
1636.	ALL
1637.	ALL
1638.	ALL
1639.	ALL
1640.	ALL
1641.	HBL, GBL
1642.	ALL
1643.	ALL
1644.	ALL
1645.	ALL
1646.	ALL
1647.	ALL
1648.	ALL
1649.	ALL
1650.	ALL
1651.	ALL
1652.	ALL
1653.	ALL
1654.	ALL
1655.	ALL
1656.	HBL, GBL

Item	*Aircraft*
1657.	ALL
1658.	ALL
1659.	ALL
1660.	ALL
1661.	ALL
1662.	ALL
1663.	ALL
1664.	ALL
1665.	ALL
1666.	ALL
1667.	ALL
1668.	AIR, GBL
1669.	AIR, GBL
1670.	ALL
1671.	ALL
1672.	ALL
1673.	ALL
1674.	ALL
1675.	PWR
1676.	ALL
1677.	ALL
1678.	ALL
1679.	ALL
1680.	ALL
1681.	ALL
1682.	ALL
1683.	ALL
1684.	ALL
1685.	PWR
1686.	PWR
1687.	PWR
1688.	PWR
1689.	ALL
1690.	ALL
1691.	ALL
1692.	ALL
1693.	ALL
1694.	ALL
1695.	ALL
1696.	ALL
1697.	PWR
1698.	PWR
1699.	PWR
1700.	AIR
1701.	ALL
1702.	ALL
1703.	ALL
1704.	ALL
1705.	AIR, RTC, GLI
1706.	ALL
1707.	AIR, GYR, GLI
1708.	ALL
1709.	ALL
1710.	ALL
1711.	GLI
1712.	GLI
1713.	GLI, HBL, GBL
1714.	GLI
1715.	GLI
1716.	GLI
1717.	GLI
1718.	GLI
1719.	GLI
1720.	GLI
1721.	GLI, HBL, GBL
1722.	GLI
1723.	GLI
1724.	GLI
1725.	ALL
1726.	ALL
1727.	ALL
1728.	ALL
1729.	ALL
1730.	ALL
1731.	ALL
1732.	AIR, RTC
1733.	AIR
1734.	ALL
1735.	PWR
1736.	ALL
1737.	ALL
1738.	ALL
1739.	ALL
1740.	ALL
1741.	ALL
1742.	ALL
1743.	ALL
1744.	ALL
1745.	PWR
1746.	PWR
1747.	ALL
1748.	ALL
1749.	ALL
1750.	ALL
1751.	ALL
1752.	GLI, HBL, GBL
1753.	GLI
1754.	HBL, GBL
1755.	GLI
1756.	HBL, GBL
1757.	AIR, RTC
1758.	AIR, RTC
1759.	AIR, RTC
1760.	AIR, RTC
1761.	AIR, RTC
1762.	PWR
1763.	PWR
1764.	PWR
1765.	PWR
1766.	PWR
1767.	PWR
1768.	ALL
1769.	ALL
1770.	ALL
1771.	ALL
1772.	PWR
1773.	PWR
1774.	AIR, RTC, GLI
1775.	PWR, GLI
1776.	ALL
1777.	PWR
1778.	PWR